CB2

Business Economics

Combined Materials Pack
for exams in 2019

The Actuarial Education Company
on behalf of the Institute and Faculty of Actuaries

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Subject CB2

2019 Study Guide

Introduction

This Study Guide has been created to help guide you through Subject CB2. It contains all the information that you will need before starting to study Subject CB2 for the 2019 exams and you may also find it useful to refer to throughout your Subject CB2 journey.

The guide is split into two parts:

- Part 1 contains general information about the Core Principles subjects

- Part 2 contains specific information about Subject CB2.

Please read this Study Guide carefully before reading the Course Notes, even if you have studied for some actuarial exams before.

Contents

1.1   Before you start

When studying for the UK actuarial exams, you will need:

- a copy of the **Formulae and Tables for Examinations of the Faculty of Actuaries and the Institute of Actuaries, 2nd Edition (2002)** – these are often referred to as simply the *Yellow Tables* or the *Tables*

- a 'permitted' **scientific calculator** – you will find the list of permitted calculators on the profession's website. Please check the list carefully, since it is reviewed each year.

These are both available from the Institute and Faculty of Actuaries' eShop. Please visit **www.actuaries.org.uk**.

1.2   Core study material

This section explains the role of the Syllabus, Core Reading and supplementary ActEd text. It also gives guidance on how to use these materials most effectively in order to pass the exam.

Some of the information below is also contained in the introduction to the Core Reading produced by the Institute and Faculty of Actuaries.

Syllabus

The Syllabus for Subject CB2 has been produced by the Institute and Faculty of Actuaries. The relevant individual Syllabus Objectives are included at the start of each course module and a complete copy of the Syllabus is included in Section 2.2 of this Study Guide. We recommend that you use the Syllabus as an important part of your study.

Core Reading

The Core Reading has been produced by the Institute and Faculty of Actuaries. The purpose of the Core Reading is to assist in ensuring that tutors, students and examiners have clear shared appreciation of the requirements of the syllabus for the qualification examinations for Fellowship of the Institute and Faculty of Actuaries.

The Core Reading supports coverage of the syllabus in helping to ensure that both depth and breadth are re-enforced. It is therefore important that students have a good understanding of the concepts covered by the Core Reading.

In examinations, students will be expected to demonstrate their understanding of the concepts.

The exams in April and September 2019 will be based on the Syllabus and Core Reading as at 31 May 2018. We recommend that you always use the up-to-date Core Reading to prepare for the exams.

Examiners will have this Core Reading and the textbooks when setting the papers. In preparing for examinations, students are advised to work through past examination questions and will find additional tuition helpful. The Core Reading will be updated each year to reflect changes in the syllabus, to reflect current practice, and in the interest of clarity.

Accreditation

The Institute and Faculty of Actuaries would like to thank the numerous people who have helped in the development of the material contained in this Core Reading.

Textbook

Each module of the course covers one or more syllabus objectives.

Each module will refer to the relevant part(s) of the textbooks. This material will be directly examinable **although you will not be tested on the detail of illustrative examples** (which may be country specific and may have been overtaken by events) **but on the underlying theory and its application.**

The referenced material will sometimes cover objectives from other modules where it is useful to consider the material together.

There is also further information available on the website linked to the textbooks as well as relevant external websites (indicated at the end of some chapters of the textbooks). This material is a useful source of additional material but it is not directly examinable.

ActEd text

Core Reading deals with each syllabus objective and covers what is needed to pass the exam. However, the tuition material that has been written by ActEd enhances it by giving examples and further explanation of key points. Here is an excerpt from some ActEd Course Notes to show you how to identify Core Reading and the ActEd material. **Core Reading is shown in this bold font.**

Note that in the example given above, the index *will* fall if the actual share price goes below the theoretical ex-rights share price. Again, this is consistent with what would happen to an underlying portfolio.

After allowing for chain-linking, **the formula for the investment index then becomes:**

This is ActEd text

This is Core Reading

$$I(t) = \frac{\sum_i N_{i,t} P_{i,t}}{B(t)}$$

where $N_{i,t}$ **is the number of shares issued for the *i*th constituent at time *t*;**

$B(t)$ **is the base value, or divisor, at time *t*.**

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1.3   ActEd study support

This section gives a description of the products offered by ActEd.

Successful students tend to undertake three main study activities:

1.   *Learning* – initial study and understanding of subject material

2.   *Revision* – learning subject material and preparing to tackle exam-style questions

3.   *Rehearsal* – answering exam-style questions, culminating in answering questions at exam speed without notes.

Different approaches suit different people. For example, you may like to learn material gradually over the months running up to the exams or you may do your revision in a shorter period just before the exams. Also, these three activities will almost certainly overlap.

We offer a flexible range of products to suit you and let you control your own learning and exam preparation. The following table shows the products that we produce. Note that not all products are available for all subjects.

LEARNING	LEARNING & REVISION	REVISION	REVISION & REHEARSAL	REHEARSAL
Course Notes	X Assignments Combined Materials Pack (CMP) X Assignment Marking Tutorials	Flashcards	Revision Notes ASET	Mock Exam Mock Marking

The products and services are described in more detail below.

'Learning' products

Course Notes

The Course Notes will help you develop the basic knowledge and understanding of principles needed to pass the exam.

Each module includes:

- the relevant syllabus objectives

- guidance on how to work through the Core Reading

- detailed checklists of the things you need to be able to do to pass the exam

- practice questions (including some past exam questions) with full solutions.

'Learning & revision' products

X Assignments

The Series X Assignments are written assessments that cover the material in each part of the course in turn. They can be used to both develop and test your understanding of the material.

Combined Materials Pack (CMP)

The Combined Materials Pack (CMP) comprises the Course Notes and the Series X Assignments.

The CMP is available in **eBook** format for viewing on a range of electronic devices. eBooks can be ordered separately or as an addition to paper products. Visit **www.ActEd.co.uk** for full details about the eBooks that are available, compatibility with different devices, software requirements and printing restrictions.

X Assignment Marking

We are happy to mark your attempts at the X assignments. Marking is not included with the Assignments or the CMP and you need to order it separately. You should submit your script as a PDF attached to an email. Your script will be marked electronically and you will be able to download your marked script via a secure link on the internet.

Don't underestimate the benefits of doing and submitting assignments:

- Question practice during this phase of your study gives an early focus on the end goal of answering exam-style questions.

- You're incentivised to keep up with your study plan and get a regular, realistic assessment of your progress.

- Objective, personalised feedback from a high quality marker will highlight areas on which to work and help with exam technique.

In a recent study, we found that students who attempt more than half the assignments have significantly higher pass rates.

There are two different types of marking product: Series Marking and Marking Vouchers.

Series Marking

Series Marking applies to a specified subject, session and student. If you purchase Series Marking, you will **not** be able to defer the marking to a future exam sitting or transfer it to a different subject or student.

We typically send out full solutions with the Series X Assignments. However, if you order Series Marking at the same time as you order the Series X Assignments, you can choose whether or not to receive a copy of the solutions in advance. If you choose not to receive them with the study material, you will be able to download the solutions via a secure link on the internet when your marked script is returned (or following the final deadline date if you do not submit a script).

If you are having your attempts at the assignments marked by ActEd, you should submit your scripts regularly throughout the session, in accordance with the schedule of recommended dates set out in information provided with the assignments. This will help you to pace your study throughout the session and leave an adequate amount of time for revision and question practice.

The recommended submission dates are realistic targets for the majority of students. Your scripts will be returned more quickly if you submit them well before the final deadline dates.

Any script submitted *after* the relevant final deadline date will not be marked. It is your responsibility to ensure that we receive scripts in good time.

Marking Vouchers

Marking Vouchers give the holder the right to submit a script for marking at any time, irrespective of the individual assignment deadlines, study session, subject or person.

Marking Vouchers can be used for any assignment. They are valid for four years from the date of purchase and can be refunded at any time up to the expiry date.

Although you may submit your script with a Marking Voucher at any time, you will need to adhere to the explicit Marking Voucher deadline dates to ensure that your script is returned before the date of the exam. The deadline dates are provided with the assignments.

Tutorials

Our tutorials are specifically designed to develop the knowledge that you will acquire from the course material into the higher-level understanding that is needed to pass the exam.

We run a range of different tutorials including face-to-face tutorials at various locations, and Live Online tutorials. Full details are set out in our *Tuition Bulletin*, which is available on our website at **www.ActEd.co.uk**.

Regular and Block Tutorials

In preparation for these tutorials, we expect you to have read the relevant part(s) of the Course Notes before attending the tutorial so that the group can spend time on exam questions and discussion to develop understanding rather than basic bookwork.

You can choose **one** of the following types of tutorial:

- **Regular Tutorials** spread over the session.

- **A Block Tutorial** held two to eight weeks before the exam.

'Revision' products

For most subjects, there is *a lot of material* to revise. Finding a way to fit revision into your routine as painlessly as possible has got to be a good strategy. Flashcards are an inexpensive option that can provide a massive boost. They can also provide a variation in activities during a study day, and so help you to maintain concentration and effectiveness.

Flashcards

Flashcards are a set of A6-sized cards that cover the key points of the subject that most students want to commit to memory. Each flashcard has questions on one side and the answers on the reverse. We recommend that you use the cards actively and test yourself as you go.

Flashcards are available in **eBook** format for viewing on a range of electronic devices. eBooks can be ordered separately or as an addition to paper products. Visit **www.ActEd.co.uk** for full details about the eBooks that are available, compatibility with different devices, software requirements and printing restrictions.

The following questions and comments might help you to decide if flashcards are suitable for you:

Flashcards

- Do you have a regular train or bus journey?

  Flashcards are ideal for regular bursts of revision on the move.

- Do you want to fit more study into your routine?

  Flashcards are a good option for 'dead time', eg using flashcards on your phone or sticking them on the wall in your study.

- Do you find yourself cramming for exams (even if that's not your original plan)?

  Flashcards are an extremely efficient way to do your pre-exam memorising.

If you are retaking a subject, then you might consider using flashcards if you didn't use them on a previous attempt.

'Revision & rehearsal' products

Revision Notes

Our Revision Notes have been designed with input from students to help you revise efficiently. They are suitable for first-time sitters who have worked through the ActEd Course Notes or for retakers (who should find them much more useful and challenging than simply reading through the course again).

The Revision Notes are a set of A5 booklets – perfect for revising on the train or tube to work. Each booklet covers one main theme or a set of related topics from the course and includes relevant past exam questions with concise solutions from the last ten years, together with other useful revision aids.

ActEd Solutions with Exam Technique (ASET)

The ActEd Solutions with Exam Technique (ASET) contains our solutions to eight past exam papers, plus comment and explanation. In particular it highlights how questions might have been analysed and interpreted so as to produce a good solution with a wide range of relevant points. This will be valuable in approaching questions in subsequent examinations.

'Rehearsal' products

Mock Exam

The Mock Exam is a 100-mark mock exam paper that provides a realistic test of your exam preparation.

Mock Marking

We are happy to mark your attempts at the mock exams. The same general principles apply as for the X Assignment Marking. In particular:

- Mock Exam Marking is available for the Mock Exam and it applies to a specified subject, session and student

- Marking Vouchers can be used for the Mock Exam.

Recall that:

- marking is not included with the products themselves and you need to order it separately

- you should submit your script as a PDF attached to an email

- your script will be marked electronically and you will be able to download your marked script via a secure link on the internet.

1.4   Skills

Technical skills

The Core Reading and exam papers for these subjects tend to be very technical. The exams themselves have many calculation and manipulation questions. The emphasis in the exam will therefore be on *understanding* the mathematical techniques and applying them to various, frequently unfamiliar, situations. It is important to have a feel for what the numerical answer should be by having a deep understanding of the material and by doing reasonableness checks.

As a high level of pure mathematics and statistics is generally required for the Core Principles subjects, it is important that your mathematical skills are extremely good. If you are a little rusty you may wish to consider purchasing additional material to help you get up to speed. The course 'Pure Maths and Statistics for Actuarial Studies' is available from ActEd and it covers the mathematical techniques that are required for the Core Principles subjects, some of which are beyond A-Level (or Higher) standard. You do not need to work through the whole course in order – you can just refer to it when you need help on a particular topic. An initial assessment to test your mathematical skills and further details regarding the course can be found on our website at www.ActEd.co.uk.

Study skills

Overall study plan

We suggest that you develop a realistic study plan, building in time for relaxation and allowing some time for contingencies. Be aware of busy times at work, when you may not be able to take as much study leave as you would like. Once you have set your plan, be determined to stick to it. You don't have to be too prescriptive at this stage about what precisely you do on each study day. The main thing is to be clear that you will cover all the important activities in an appropriate manner and leave plenty of time for revision and question practice.

Aim to manage your study so as to allow plenty of time for the concepts you meet in these courses to 'bed down' in your mind. Most successful students will probably aim to complete the courses at least a month before the exam, thereby leaving a sufficient amount of time for revision. By finishing the courses as quickly as possible, you will have a much clearer view of the big picture. It will also allow you to structure your revision so that you can concentrate on the important and difficult areas.

You can also try looking at our discussion forum on the internet, which can be accessed at **www.ActEd.co.uk/forums** (or use the link from our home page at **www.ActEd.co.uk**). There are some good suggestions from students on how to study.

Study sessions

Only do activities that will increase your chance of passing. Try to avoid including activities for the sake of it and don't spend time reviewing material that you already understand. You will only improve your chances of passing the exam by getting on top of the material that you currently find difficult.

Ideally, each study session should have a specific purpose and be based on a specific task, *eg* '*Finish reading Module 3 and attempt Practice Questions 3.4, 3.7 and 3.12* ', as opposed to a specific amount of time, *eg 'Three hours studying the material in Module 3*'.

Try to study somewhere quiet and free from distractions (*eg* a library or a desk at home dedicated to study). Find out when you operate at your peak, and endeavour to study at those times of the day. This might be between 8*am* and 10*am* or could be in the evening. Take short breaks during your study to remain focused – it's definitely time for a short break if you find that your brain is tired and that your concentration has started to drift from the information in front of you.

Order of study

We suggest that you work through each of the modules in turn. To get the maximum benefit from each module you should proceed in the following order:

1.   Read the Syllabus Objectives. These are set out in the box at the start of each module.

2.   Read the introduction at the start of each module. This will give you a useful overview of the material that you are about to study and help you to appreciate the context of the ideas that you meet.

3.   Read the guidance at the start of each section. This will give you some handy hints and tips about the material covered in that section.

4.   Study the Core Reading (either in the textbook(s), or separately in the module). As you study, pay particular attention to the checklists.

5.   Do the questions at the end of each section as you come to them.

6.   Attempt (at least some of) the Practice Questions that appear at the end of the module.

It's a fact that people are more likely to remember something if they review it several times. So, do look over the modules you have studied so far from time to time. It is useful to work through the checklists or to try the Practice Questions again a few days after reading the module itself. It's a good idea to annotate the questions with details of when you attempted each one. This makes it easier to ensure that you try all of the questions as part of your revision without repeating any that you got right first time.

Once you've read the relevant part of the notes and tried a selection of questions from the Practice Questions (and attended a tutorial, if appropriate) you should attempt the corresponding assignment. If you submit your assignment for marking, spend some time looking through it carefully when it is returned. It can seem a bit depressing to analyse the errors you made, but you will increase your chances of passing the exam by learning from your mistakes. The markers will try their best to provide practical comments to help you to improve.

To be really prepared for the exam, you should not only know and understand the Core Reading but also be aware of what the examiners will expect. Your revision programme should include plenty of question practice so that you are aware of the typical style, content and marking structure of exam questions. You should attempt as many past exam questions as you can.

Active study

Here are some techniques that may help you to study actively.

1.   Don't believe everything you read. Good students tend to question everything that they read. They will ask 'why, how, what for, when?' when confronted with a new concept, and they will apply their own judgement. This contrasts with those who unquestioningly believe what they are told, learn it thoroughly, and reproduce it (unquestioningly?) in response to exam questions.

2.   Another useful technique as you read the Course Notes is to think of possible questions that the examiners could ask. This will help you to understand the examiners' point of view and should mean that there are fewer nasty surprises in the exam room. Use the Syllabus to help you make up questions.

3.   Annotate your notes with your own ideas and questions. This will make you study more actively and will help when you come to review and revise the material. Do not simply copy out the notes without thinking about the issues.

4.   Attempt the questions in the modules as you work through the course. Write down your answer before you refer to the solution.

5.   Attempt other questions and assignments on a similar basis, *ie* write down your answer before looking at the solution provided. Attempting the assignments under exam conditions has some particular benefits:

    •   It forces you to think and act in a way that is similar to how you will behave in the exam.

    •   When you have your assignments marked it is *much* more useful if the marker's comments can show you how to improve your performance under exam conditions than your performance when you have access to the notes and are under no time pressure.

    •   The knowledge that you are going to do an assignment under exam conditions and then submit it (however good or bad) for marking can act as a powerful incentive to make you study each part as well as possible.

    •   It is also quicker than trying to write perfect answers.

6.   Sit a mock exam four to six weeks before the real exam to identify your weaknesses and work to improve them. You could use a mock exam written by ActEd or a past exam paper.

You can find further information on how to study in the profession's Student Handbook, which you can download from their website at:

   www.actuaries.org.uk/studying

Revision and exam skills

Revision skills

You will have sat many exams before and will have mastered the exam and revision techniques that suit you. However it is important to note that due to the high volume of work involved in the Core Principles subjects it is not possible to leave all your revision to the last minute. Students who prepare well in advance have a better chance of passing their exams on the first sitting.

Unprepared students find that they are under time pressure in the exam. Therefore it is important to find ways of maximising your score in the shortest possible time. Part of your preparation should be to practise a large number of exam-style questions under timed exam conditions as soon as possible. This will:

- help you to develop the necessary understanding of the techniques required

- highlight the key topics, which crop up regularly in many different contexts and questions

- help you to practise the specific skills that you will need to pass the exam.

There are many sources of exam-style questions. You can use past exam papers, the Practice Questions at the end of each module (which include many past exam questions), assignments, mock exams, the Revision Notes and ASET.

Exam question skill levels

Exam questions are not designed to be of similar difficulty. The Institute and Faculty of Actuaries specifies different skill levels that questions may be set with reference to.

Questions may be set at any skill level:

- Knowledge – demonstration of a detailed knowledge and understanding of the topic

- Application – demonstration of an ability to apply the principles underlying the topic within a given context

- Higher Order – demonstration of an ability to perform deeper analysis and assessment of situations, including forming judgements, taking into account different points of view, comparing and contrasting situations, suggesting possible solutions and actions, and making recommendations.

Command verbs

The Institute and Faculty of Actuaries use command verbs (such as 'Define', 'Discuss' and 'Explain') to help students to identify what the question requires. The profession has produced a document, 'Command verbs used in the Associate and Fellowship written examinations', to help students to understand what each command verb is asking them to do.

It also gives the following advice:

- The use of a specific command verb within a syllabus objective does not indicate that this is the only form of question which can be asked on the topic covered by that objective.

- The Examiners may ask a question on any syllabus topic using any of the agreed command verbs, as are defined in the document.

You can find the relevant document on the profession's website at:

https://www.actuaries.org.uk/studying/prepare-your-exams

1.5   The examination

What to take to the exam

IMPORTANT NOTE: The following information was correct at the time of printing, however it is important to keep up-to-date with any changes. See the profession's website for the latest guidance.

For the written exams the examination room will be equipped with:

- the question paper

- an answer booklet

- rough paper

- a copy of the Yellow Tables.

Remember to take with you:

- black pens

- a permitted scientific calculator – please refer to **www.actuaries.org.uk** for the latest advice.

Past exam papers

You can download some past exam papers and Examiners' Reports from the profession's website at **www.actuaries.org.uk**. However, please be aware that these exam papers are for the pre-2019 syllabus and not all questions will be relevant.

1.6   Queries and feedback

Questions and queries

From time to time you may come across something in the study material that is unclear to you. The easiest way to solve such problems is often through discussion with friends, colleagues and peers – they will probably have had similar experiences whilst studying. If there's no-one at work to talk to then use our discussion forum at **www.ActEd.co.uk/forums** (or use the link from our home page at **www.ActEd.co.uk**).

Our online forum is dedicated to actuarial students so that you can get help from fellow students on any aspect of your studies from technical issues to study advice. You could also use it to get ideas for revision or for further reading around the subject that you are studying. ActEd tutors will visit the site from time to time to ensure that you are not being led astray and we also post other frequently asked questions from students on the forum as they arise.

If you are still stuck, then you can send queries by email to the relevant subject email address (see Section 2.6), but we recommend that you try the forum first. We will endeavour to contact you as soon as possible after receiving your query but you should be aware that it may take some time to reply to queries, particularly when tutors are away from the office running tutorials. At the busiest teaching times of year, it may take us more than a week to get back to you.

If you have many queries on the course material, you should raise them at a tutorial or book a personal tuition session with an ActEd tutor. Information about personal tuition is set out in our current brochure. Please email **ActEd@bpp.com** for more details.

Feedback

If you find an error in the course, please check the corrections page of our website (**www.ActEd.co.uk/paper_corrections.html**) to see if the correction has already been dealt with. Otherwise please send details via email to the relevant subject email address (see Section 2.6).

Each year our tutors work hard to improve the quality of the study material and to ensure that the courses are as clear as possible and free from errors. We are always happy to receive feedback from students, particularly details concerning any errors, contradictions or unclear statements in the courses. If you have any comments on this course please email them to the relevant subject email address (see Section 2.6).

Our tutors also work with the profession to suggest developments and improvements to the Syllabus and Core Reading. If you have any comments or concerns about the Syllabus or Core Reading, these can be passed on via ActEd. Alternatively, you can send them directly to the Institute and Faculty of Actuaries' Examination Team by email to **education.services@actuaries.org.uk**.

2.1   Subject CB2 – background

History

The Business subjects (Subjects CB1, CB2 and CB3) are new subjects in the Institute and Faculty of Actuaries 2019 Curriculum. ActEd is not involved in the delivery of Subject CB3.

Subject CB2 is *Business Economics*.

Predecessors

The topics covered in the Business subjects (Subjects CB1 and CB2) cover content previously in Subjects CT2 and CT7:

- Subject CB1 replaces Subject CT2.

- Subject CB2 replaces Subject CT7.

Exemptions

You will need to have passed or been granted an exemption from Subject CT7 to be eligible for a pass in Subject CB2 during the transfer process.

Links to other subjects

- Subjects CB1 and CB3 – Business Finance and Business Management are the other subjects in the *Business* module.

- Subject CM2 – Financial Engineering and Loss Reserving, which covers the principles of actuarial modelling, the behaviour of financial markets, and the pricing of financial products.

- Subject CP1 – Actuarial Practice, which builds on basic economic relationships to explore the impact of the economic environment on the investment markets.

- Subject SP5 – Investment and Finance Principles, which covers the key principles of evaluating, selecting and risk managing a portfolio of investments.

- Other Specialist Principles subjects and all the Specialist Advanced subjects require the use of economic judgement.

2.2   Subject CB2 – Syllabus and Core Reading

Syllabus

The Syllabus for Subject CB2 is given here. To the right of each objective are the module numbers in which the objective is covered in the ActEd course.

Aim

The aim of the Business Economics subject is to introduce students to the core economic principles and how these can be used in a business environment to help decision making and behaviour.

It provides the fundamental concepts of microeconomics that explain how economic agents make decisions and how these decisions interact.

It explores the principles underlying macroeconomics that explain how the economic system works, where it fails and how decisions taken by economic agents affect the economic system.

Competences

On successful completion of this subject, a student will be able to:

1.   show a systematic knowledge and critical awareness of economic theory in the areas of syllabus covered by the subject

2.   apply a range of techniques to solve problems in the areas of syllabus covered by the subject

3.   appreciate recent developments and methodologies in economics

4.   understand the relevance of economic theory to the business environment and the links between economic theory and its application in business

5.   apply basic microeconomic and macroeconomic theory to business problems.

Syllabus topics

1.   Economic models and recent historical applications   (10%)

2.   Microeconomics   (45%)

    •   behaviour of consumers

    •   behaviour of firms

    •   behaviour of markets

3.   Macroeconomics   (45%)

    •   relationships between governments, markets and firms

    •   government policies

    •   international trade

These weightings are indicative of the approximate balance of the assessment of this subject between the main syllabus topics, averaged over a number of examination sessions.

The weightings also have a correspondence with the amount of learning material underlying each syllabus topic. However, this will also reflect aspects such as:

- the relative complexity of each topic, and hence the amount of explanation and support required for it

- the need to provide thorough foundation understanding on which to build the other objectives

- the extent of prior knowledge which is expected

- the degree to which each topic area is more knowledge or application based.

Detailed syllabus objectives

1.   Economic models and recent historical applications   (10%)

      1.1   Discuss the relevance of economics to the world of business.   (Module 1)

      1.1.1   Describe what is meant by opportunity cost and scarcity and their relevance to economic choice.

      1.1.2   Discuss the core economic concepts involved in choices made by businesses relevant to selection of outputs, inputs, technology, location and competition.

      1.1.3   Contrast microeconomics and macroeconomics.

      1.2   Assess the main strands of economic thinking: (Modules 2, 10, 16, 17 and 23)

            - classical
            - Marxian socialism
            - neo-classical, Keynesian, neo-Keynesian and post-Keynesian
            - monetarist
            - Austrian

      1.3   Analyse the recent macroeconomic history.   (Modules 14, 15, 20, 22 and 23)

      1.3.1   Describe the progress of the world economy since the Great Depression.

            - a history of banking crises and irrational behaviour
            - consequences of banking crises

      1.3.2   Discuss the banking crisis of 2008, the Great Recession and recovery.

      1.3.3   Describe the effectiveness of monetary policy in the 2008 financial crisis and the governments' actions to combat recession.

      1.3.4   Discuss the aftershocks in Europe following the 2008 financial crisis.

      1.3.5   Assess the stimulus-austerity debate and regulatory action after the 2008 crisis.

2.   Microeconomics – the behaviour of consumers, firms and markets   (45%)

2.1   Discuss the workings of competitive markets.   (Modules 3 and 4)

2.1.1   Discuss how the markets operate:

- Explain the role of the price mechanism in a free market.
- Discuss the behaviour of firms and consumers in such markets.

2.1.2   Describe the factors which influence the market demand and supply.

2.1.3   Describe and discuss how market equilibrium quantity and price are achieved.

2.1.4   Discuss how markets react to changes in demand and supply.

2.1.5   Define and calculate price and income elasticities of demand and price elasticity of supply:

- Calculate elasticities of demand using both original and average quantities.

2.1.6   Discuss the factors that affect elasticity.

2.1.7   Explain the effect of elasticity on the workings of markets in the short and long run.

2.1.8   Discuss how firms deal with risk and uncertainty about future market movements.

2.1.9   Describe price expectations and speculation and how price bubbles develop.

2.2   Discuss consumer demand and behaviour.   (Module 5)

2.2.1   Describe the concept of utility and representation of consumer preferences as indifference curves.

2.2.2   Discuss rational choice and how optimal consumption choice is determined by using indifference curves and budget lines.

2.2.3   Discuss the concepts of rational choice, perfect information and irrational behaviour in behavioural economics.

2.3   Discuss the importance of advertising for a firm.   (Module 4)

2.3.1   Explain the effects of advertising on sales and demand.

2.4   Discuss the production function, costs of production, revenue and profit in order
        to understand a firm's price and output decisions.   (Module 6)

2.4.1   Explain how the production function reflects the relationship between inputs and
        outputs in the short and long run.

2.4.2   Define average and marginal physical product.

2.4.3   Describe the meaning and measurement of costs and explain how these vary with
        output in the short and long run.

2.4.4   Define total, average and marginal costs.

2.4.5   Describe what is meant by 'economies of scale' and explain the reasons for such
        economies and how a business can achieve efficiency in selecting the level of its
        inputs.

2.4.6   Describe revenue and profit and explain how both are influenced by market
        conditions.

2.4.7   Define and calculate average and marginal revenue.

2.4.8   Describe how profit is measured and explain how the firm arrives at its
        profit-maximising output.

2.4.9   Explain what is meant by the 'shut-down' point in the short and long run.

2.5   Discuss profit maximisation under perfect competition and monopoly. (Module 7)

2.5.1   Explain what determines the market power of a firm.

2.5.2   Describe the main features of a market characterised by perfect competition.

2.5.3   Explain how output and price are determined in such markets in the short and
        long run.

2.5.4   Describe how monopolies emerge, how a monopolist selects its profit-maximising
        price and output and how much profit a monopolist makes.

2.5.5   Describe the barriers to entry in an industry and a contestable market and explain
        how these affect a monopolist's profit.

2.6   Discuss profit maximisation under imperfect competition.   (Module 8)

2.6.1   Describe the behaviour of firms under monopolistic competition and explain why in this type of market only normal profits are made in the long run.

2.6.2   Describe the main features of an oligopoly and explain how firms behave in an oligopoly.

2.6.3   Discuss what determines competition and collusion of firms in an oligopoly and how the strategic decisions of such firms can be explained by game theory.

2.6.4   Discuss if firms in an oligopoly act in consumers' interest.

2.7   Assess various pricing strategies that firms can adopt.   (Module 9)

2.7.1   Describe how prices are determined in practice and factors that affect the ability of a firm to determine its prices.

2.7.2   Describe average cost pricing and price discrimination.

2.7.3   Discuss pricing strategy for multiple products and explain how pricing varies with the stage in the life of a product.

3.   Macroeconomics – relationships between governments, markets and firms, government policies and international trade   (45%)

3.1   Discuss the reasons for government intervention in the market.   (Module 10)

3.1.1   Explain and discuss the extent to which businesses meet the interests of consumers and society in general.

3.1.2   Explain in what sense perfect markets are 'socially efficient' and why most markets fail to achieve social efficiency.

3.1.3   Explain why externalities can lead to inefficient markets.

3.1.4   Describe the ways in which governments intervene in markets in order to influence business behaviour and explain the drawbacks of such intervention.

3.1.5   Explain and discuss whether taxation or regulation could be more useful in correcting markets' shortcomings.

3.2   Discuss the relationship between the government and the individual firm.

                                                                          (Module 10)

3.2.1   Describe the main targets of 'competition policy' and explain the extent to which it is effective.

3.2.2   Explain why a free market fails to achieve the optimal amount of research and development.

3.2.3   Describe the various forms of intervention that the government can undertake in order to encourage technological advance and innovation.

3.3   Discuss globalisation and multinational business.   (Module 13)

3.3.1   Describe what is meant by globalisation and its impact on business.

3.3.2   Explain what is driving the process of globalisation and whether the world
         benefits from globalisation of business.

3.4   Discuss the importance of international trade.   (Module 13)

3.4.1   Describe the growth of international trade and its benefits to countries and firms.

3.4.2   Explain the advantages of specialisation.

3.4.3   Discuss the arguments for trade restriction and protection of domestic industries.

3.4.4   Explain the role of the World Trade Organisation (WTO) in international trade.

3.5   Discuss the macroeconomic environment of the business. (Modules 11, 12 and 16)

3.5.1   Describe the main macroeconomic variables that governments seek to control.

3.5.2   Explain what determines the level of economic activity and hence the overall
         business climate.

3.5.3   Describe the effect on business output if a stimulus is given to the economy.

3.5.4   Contrast actual and potential growth.

3.5.5   Describe the factors that determine economic growth and explain the reasons for
         differences in different nations' growth rates.

3.5.6   Discuss the relationship between economic growth and environmental
         sustainability.

3.5.7   Describe why economies experience periods of boom followed by periods of
         recession and explain factors which influence the length and magnitude of the
         phases of a business cycle.

3.5.8   Describe the causes and costs of unemployment and how unemployment relates
         to the level of business activity.

3.5.9   Discuss the determination of the price level in the economy by the interaction
         between aggregate supply and aggregate demand in a simple AS-AD model.

3.5.10   Describe the causes and costs of inflation and how inflation relates to the level of
         business activity.

3.5.11   Explain what is meant by GDP and describe how it is measured.

3.5.12   Discuss the representation of the economy as a simple model of the circular flow
         of income.

3.6   Discuss what is meant by the balance of payments and how exchange rates are
        determined.   (Modules 13, 21 and 22)

3.6.1   Describe what is meant by 'the balance of payments' and how trade and financial
        movements affect it.

3.6.2   Explain how exchange rates are determined and how changes in exchange rates
        affect business.

3.6.3   Explain the relationship between the balance of payments and the exchange
        rates.

3.6.4   Discuss the advantages and disadvantages of fixed and floating exchange rates.

3.6.5   Explain how governments and/or central banks seek to influence the exchange
        rates.

3.6.6   Describe the implications of such actions for other macroeconomic policies and
        for business.

3.6.7   Describe the purpose and examine the effectiveness of monetary union and single
        currencies, with reference to the European Economic and Monetary Union, the
        Exchange Rate Mechanism and the creation of a single currency.

3.7   Discuss the role of money and interest rates in the economy.

                                                                             (Modules 14, 15 and 18)

3.7.1   Describe the function of money.

3.7.2   Describe what determines the amount of money in the economy, what causes it
        to grow and what is the role of banks in this process.

3.7.3   Discuss the concept of the money multiplier in the real world.

3.7.4   Describe how interest rates are determined.

3.7.5   Explain the relationship between money and interest rates.

3.7.6   Explain why central banks play a crucial role in the functioning of economies.

3.7.7   Describe how a change in the money supply and/or interest rates affects the level
        of business activity.

3.8   Discuss the role, structure and stability of the financial system.   (Module 14)

3.8.1   Describe the different financial systems.

3.8.2   Evaluate how effectively different financial systems operate, with reference to the UK and China.

3.8.3   Describe the role of the financial markets and how financial markets help to achieve a nation's objectives.

3.8.4   Describe the different participants in the financial markets.

3.8.5   Discuss the development of financial systems and the factors affecting the stability of financial systems.

3.9   Discuss what determines the level of business activity and how it affects unemployment and inflation.   (Modules 12, 16, 17 and 18)

3.9.1   Discuss how the equilibrium level of income is determined within a simple aggregate demand-expenditure model.

3.9.2   Describe the concept of the multiplier and calculate its value.

3.9.3   Describe the effect of a rise in money supply on output and prices.

3.9.4   Describe the relationship between unemployment and inflation and whether the relationship is stable.

3.9.5   Discuss how business and consumer expectations affect the relationship between unemployment and inflation and explain how such expectations are formed.

3.9.6   Describe how a policy of targeting inflation affects the relationship between unemployment and inflation.

3.9.7   Describe what determines the course of a business cycle and its turning points.

3.9.8   Discuss whether the business cycle is caused by changes in aggregate demand, or changes in aggregate supply (or both).

3.10   Assess how macroeconomic policies impact on businesses.   (Modules 15 and 20)

3.10.1 Describe the types of macroeconomic policy that are likely to impact on business and explain the way in which this impact takes effect.

3.10.2 Describe the impact of fiscal policy on the economy and business, and factors that determine its effectiveness in smoothing out economic fluctuations.

3.10.3 Describe the fiscal rules adopted by the government and discuss if following these rules is a good idea.

3.10.4 Explain how monetary policy works in the UK and the Eurozone and describe the roles of the Bank of England and the European Central Bank.

3.10.5 Explain how targeting inflation influences interest rates and hence the economic activity.

3.10.6 Discuss the merits of following a simple inflation target as a rule for determining interest rates, and suggest an alternative rule.

3.11   Assess how supply-side policies impact on businesses.   (Module 19)

3.11.1 Describe the effect of supply-side policies on business and the economy.

3.11.2 Describe the types of supply-side policies that can be pursued and discuss their effectiveness.

3.11.3 Explain the impact on business of a policy of tax cuts.

3.11.4 Describe the major types of policy open to governments to encourage increased competition.

Core Reading

Accreditation

The Core Reading consists of references to material from:

Sloman, J., Wride, A., Garratt, D., 2018, *Economics,* 10th ed., Pearson

ISBN: 978-1-292-18785-3 (print)
ISBN: 978-1-292-18790-7 (PDF)
ISBN: 978-1-292-18786-0 (ePub)

There are some additional references to a few sections from:

Sloman, J., Garratt, D., Guest, J., Jones, E., 2016, *Economics for Business,* 7th ed., Pearson

ISBN: 978-1-292-08210-3 (print)
ISBN: 978-1-292-08211-0 (PDF)
ISBN: 978-1-292-08217-2 (EPub)

which students can access via the ebook (MyiLibrary) service using their Athens password:
http://lib.myilibrary.com?id=926627&ref=Athens

In addition, there are three extra sections of Core Reading, which are included within the relevant modules in the ActEd Course Notes.

Further reading

The exam will be based on the relevant Syllabus and Core Reading (including the textbook) and the ActEd course material will be the main source of tuition for students.

There is also further information available on the website linked to the textbooks as well as relevant external websites (indicated at the end of some chapters of the textbooks). This material is a useful source of additional material but it is not directly examinable.

2.3 Subject CB2 – the course structure

There are three parts to the Subject CB2 course. The parts cover related topics and have broadly equal marks in the exam. The parts are broken down into modules.

The following table shows how the parts, the modules and the syllabus items relate to each other. The end columns show how the modules relate to the days of the regular tutorials. We have also given you a broad indication of the length of each module. This table should help you plan your progress across the study session.

Part	Module	Title	No of pages	Syllabus objectives	3 full days
1	1	Economic concepts and systems	14	1.1	1
	2	Main strands of economic thinking	15	1.2	
	3	Supply and demand (1)	21	2.1	
	4	Supply and demand (2)	28	2.1, 2.3	
	5	Background to demand	36	2.2	
	6	Background to supply	39	2.4	
	7	Perfect competition and monopoly	28	2.5	
	8	Monopolistic competition and oligopoly	27	2.6	
	9	Pricing strategies	22	2.7	
2	10	Market failure and government intervention	41	1.2, 3.1, 3.2	2
	11	The macroeconomic environment	28	3.5	
	12	Macroeconomic objectives	23	3.5, 3.9	
	13	International trade and payments	29	3.3, 3.4, 3.6	
	14	The financial system and the money supply	32	1.3, 3.7, 3.8	
	15	The money market and monetary policy	18	1.3, 3.7, 3.10	
3	16	Classical and Keynesian theory	52	1.2, 3.5, 3.9	3
	17	Monetarist and new classical schools, and Keynesian responses	30	1.2, 3.9	
	18	Relationship between the goods and money markets	30	3.7, 3.9	
	19	Supply-side policy	16	3.11	
	20	Demand-side policy	23	1.3, 3.10	
	21	Exchange rate policy	26	3.6	
	22	Global harmonisation and monetary union	15	1.3, 3.6	
	23	Summary of debates on theory and policy	23	1.2, 1.3	

2.4   Subject CB2 – summary of ActEd products

The following products are available for Subject CB2:

- Course Notes
- X Assignments – three assignments:
    - X1-X3: 100-mark tests (you are allowed 3¼ hours to complete these)

    and X Assignment marking (Series Marking and Marking Vouchers)
- Flashcards
- Revision Notes – a set of A5 booklets
- ASET – four years' exam papers, *ie* eight papers, covering the period April 2014 to September 2017
- Mock Exam and marking (Series Marking and Marking Vouchers).

We will endeavour to release as much material as possible but unfortunately some revision products may not be available until the September 2019 or even April 2020 exam sessions. Please check the ActEd website or email ActEd@bpp.com for more information.

The following tutorials are typically available for Subject CB2:

- regular tutorials (three days)
- block tutorials (three days).

Full details are set out in our *Tuition Bulletin*, which is available on our website at www.ActEd.co.uk.

2.5 Subject CB2 – skills and assessment

Technical skills

The *Business* subjects (Subjects CB1 and CB2) are more 'wordy' (and less mathematical) than the other Core Principles subjects.

Subject CB2 also typically includes 'free-form' answer questions, which might be considered to be more 'essay-style' in nature. Don't panic if you haven't written an essay in a while – it is more important to come up with a set of clear, concise points than to answer with flowing prose.

Exam skills

Exam question skill levels

In Subject CB2, the approximate split of assessment across the three skill types is:

- Knowledge – 40%

- Application – 45%

- Higher Order skills – 15%.

Assessment

Assessment consists of a 3¼-hour paper-based examination involving objective test questions and 'free-form' answer questions.

2.6   Subject CB2 – frequently asked questions

Q: *I have an older edition of the textbook, rather than the current tenth edition. How does the new version differ from the old versions and what should I do to prepare for the new exam??*

A: There are a number of changes and additions to the textbook. The 2019 exams will be based on the tenth edition of the textbook, so we recommend that you use it.

Q: *What knowledge of earlier subjects should I have?*

A: No knowledge of earlier subjects is required.

Q: *What level of mathematics is required?*

A: There is some use of basic arithmetic and algebra in Subject CB2 and you may also need to use basic calculus.

Q: *What other skills are required?*

A: Diagrams are part of an economist's toolkit, so you need to be able to draw clear and accurate diagrams. You might want to buy a ruler and some fine-nib pens.

You also need to use language precisely. For example, the observation that 'prices are falling' is not the same as 'the inflation rate is falling'.

Q: *Should I read the various boxes in the textbook?*

A: The boxes are part of the Core Reading on which you will be tested. However, the guidance issued by the Profession states that you will *not be tested on the detail of illustrative examples* but on the *underlying theory and its application*. This suggests that you do not need to know all of the information in the boxes. The guidance in the Course Notes therefore highlights what we think are the important points that are mentioned in the boxes.

Q: *Should I do the Review Questions in the textbook?*

A: Only if you find them interesting and *have the time.* It is probably more sensible to concentrate on practising the questions throughout and at the end of the modules, the assignments and, most importantly, the past exam papers. This is because these questions have been designed specifically to prepare you for the Subject CB2 exam and/or represent the types of questions you will actually need to answer in the Subject CB2 exam.

Q: ***What should I do if I discover an error in the course?***

A: If you find an error in the course, please check our website at:

www.ActEd.co.uk/paper_corrections.html

to see if the correction has already been dealt with. Otherwise please send details via email to **CB2@bpp.com**.

Q: ***Who should I send feedback to?***

A: We are always happy to receive feedback from students, particularly details concerning any errors, contradictions or unclear statements in the courses.

If you have any comments on this course in general, please email to **CB2@bpp.com**.

If you have any comments or concerns about the Syllabus or Core Reading, these can be passed on to the profession via ActEd. Alternatively, you can send them directly to the Institute and Faculty of Actuaries' Examination Team by email to **education.services@actuaries.org.uk**.

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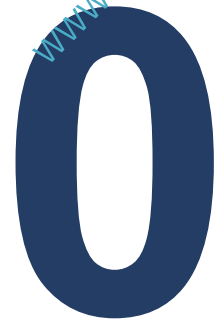
Introduction to Subject CB2

Aim of the course

The aim of the course is to introduce you to the fundamental economic concepts that affect businesses.

Syllabus

The syllabus objectives are stated in the Study Guide and are repeated at the start of the relevant module. The syllabus for Subject CB2 is significantly different from its predecessor Subject CT7.

Core Reading

The Core Reading consists mainly of references to material from 'Economics' by John Sloman, Dean Garratt, and Jon Guest (10th edition, 2018). The relevant chapters of the textbook are specified at the start of each module. Each chapter contains the main text plus up-to-date tables, graphs, diagrams and real-life case studies.

There are some additional references to a few sections from 'Economics for Business' by John Sloman, Dean Garratt, Jon Guest and Elizabeth Jones (7th edition, 2016), which you can access via the ebook (MyiLibrary) service using your Athens password:
http://lib.myilibrary.com?id=926627&ref=Athens

The Profession has specified the following limits on the extent to which the material in the textbook is examinable:

- **This material will be directly examinable *although you will not be tested on the detail of illustrative examples* (which may be country-specific and may have been overtaken by events) *but on the underlying theory and its application*.**

- **There is also further information available on the website linked to the textbooks as well as relevant external websites (indicated at the end of some chapters of the textbooks).   This material is a useful source of additional material but it is not directly examinable.**

There is also a small amount of additional Core Reading as follows:

- alternative economic models (Module 2)

- the financial system (Module 14)

- macroeconomic history (Module 14).

The Subject CB2 exam structure

The Subject CB2 exam structure is the same as that of its predecessor, Subject CT7, which typically consisted of:

- 26 multiple-choice questions (1.5 marks each, totalling 39 marks)

- approximately ten short-answer questions (2-6 marks each, totalling 41 marks)

- two long-answer questions (10 marks each, totalling 20 marks).

Aims of the ActEd Course

The Core Reading for Subject CB2 is found mainly in the textbooks, rather than embedded in the ActEd Course Notes as is the case in most other courses. Therefore, the ActEd Course Notes have a slightly different purpose; they will guide you through that reading and prepare you for the Subject CB2 examination with advice and question practice.

The structure of the ActEd Course Notes

The course is split into three parts, which cover related topics and have broadly equal lengths. Each part contains between six and nine modules.

Part 1:   Markets and market structures

            (Modules $1-9$)

Part 2:   Market failure and the macroeconomic environment

            (Modules $10-15$)

Part 3:   Macroeconomic theory and policy

            (Modules $16-23$)

Each **module** contains:

- the syllabus objectives covered in that module

- details of the Core Reading

- an introduction to the module

- a number of **sections**, each containing:

  – an overview of what's included in the section

  – guidance to help with the reading

  – the Core Reading for the section

  – a checklist of the important definitions, concepts and formulae that you should know, diagrams you should be able to draw and other tasks that you should be able to perform

  – a number of questions, many of which are exam-style questions, to test your understanding of the material covered in the section

- a set of practice questions to test your understanding of the module as a whole.

How to use the ActEd Course Notes

- Read the **introduction** to the module. We try to set the scene for the forthcoming module so that you know what's coming next. We might also place it in context with what has come before and/or what is still left to come. We will also state whether or not the material is new to Subject CB2.

- For **each section**:

  – Read 'What's included in this section'. The main items identified here as bullet points will usually correspond to the main subheadings in the textbook. We have sometimes used different bullet points if we think our structure is more helpful in the context of the Subject CB2 syllabus and exam.

  – Read 'Guidance'. This highlights a variety of issues, such as important concepts, beliefs and distinctions, common mistakes made by students, hints for drawing diagrams, important points that are mentioned in boxes but not in the main body of the text, topics that will be discussed in more detail in later modules and types of questions that have tended to be asked in the past.

  – Read the Core Reading in the textbook, being mindful of the tasks listed in the 'Checklist'.

  – Make your own notes, using the subheadings given in the 'What's included' section and the tasks listed in the 'Checklist'.

  – Attempt the questions in the 'Questions' section. This is a **very important part of your study**. Tackling these questions should develop your knowledge and understanding and increase your confidence. We have tried to ensure good coverage of the syllabus, have included lots of exam-style questions (including many past exam questions) and have included helpful hints and comments in the solutions.

  – Revisit your notes. Having attempted the questions, your notes might now make more sense to you. You might wish to amend them.

- When you have finished all of the sections, attempt the 'Practice Questions' at the end of the module. Most of these are exam-style questions and many are actual past exam questions. Again, this is a very important stage in your study.

Getting started

Before you launch straight into Module 1, there are three things you might like to do:

1.　　Spend some time *getting to know the textbook*. There is a note from the author on pages *xv–xvi*, and a section on pages *xix* and *xxi* about companion resources that are available.

2.　　Read the introductory chapter in the textbook, entitled '*Why economics is good for you*', pages 2–5, in which the authors illustrate that economic issues are all around us.

3.　　Read Appendix 1, towards the end of the textbook, which covers a *range of techniques of economic analysis*.

　　　It describes how economic data is often analysed and presented and will help you to understand how economics is actually reported in practice, in the news media and on the internet, and to interpret the figures and tables that appear throughout the textbook.

　　　In addition, the ability to represent ideas visually by drawing diagrams is a skill that is likely to be tested in the exam itself. Likewise, you may be required to perform manipulations and calculations based on simple formulae capturing the relationships between different economic variables, *eg* equating the demand for and supply of a good to find its equilibrium market price and quantity traded.

　　　Although you might already be familiar with some of these techniques, this reference is worth a look. You can always skip through it quickly if you find it easy.

1

Economic concepts and systems

Syllabus objectives

1.1 Discuss the relevance of economics to the world of business.

    1. Describe what is meant by opportunity cost and scarcity and their relevance to economic choice.

    2. Discuss the core economic concepts involved in choices made by businesses relevant to the selection of outputs, inputs, technology, location and competition.

    3. Contrast microeconomics and macroeconomics.

Core Reading

Chapter 1 (Sections 1 and 2)   *Pages 7–27*

0   Introduction

In this module we consider what economics is all about and how different economic systems operate.

Economics is about ways of dealing with the problem of *scarcity*, *ie* the excess of human wants over what can actually be produced to fulfil those wants.

There are two main aims when trying to deal with this problem. Firstly, the available resources should be fully and efficiently employed so that the full potential output is achieved and, over time, increased; and secondly, rational choices must be made concerning the precise use of the resources so that an efficient and fair allocation of those resources is achieved.

This is why economics is divided into two main branches:

1.   *macroeconomics* – which is concerned with the economy as a whole, such as the overall level of output and employment in the economy

2.   *microeconomics* – which looks at individual units in the economy, such as consumers and firms.

Section 1 is a general introduction to these topics.

Different economic systems have different ways of dealing with scarcity. Section 2 examines the two extremes:

1.   *command economies* – in which the state makes all of the economic decisions

2.   *free market economies* – in which the free working of the market forces of supply and demand determines the use of resources.

In practice, most economies are *mixed*, *ie* a mixture of the two extremes.

The material on economic systems is new to Subject CB2 (though it was in the pre-2010 Subject CT7 syllabus).

1   What economists study

1.1   What's included in this section

- The problem of scarcity

- Demand and supply

- Dividing up the subject (into macroeconomics and microeconomics)

- Macroeconomics

- Microeconomics

- Illustrating economic issues with the production possibility curve

- Illustrating economic issues with the circular flow of goods and incomes

1.2   Guidance

As a guide to the reading, the following might be of help:

- This is a good introduction to the subject. Although the number of new concepts introduced here might seem a little overwhelming, many of the issues will be discussed in more detail in later modules.

- In the checklist that follows the reading, priority has been given to the concepts and issues that are likely to be examined at an elementary level, *ie* without any detail beyond this module.

- The production possibility curve is new to CB2, but it was in the pre-2010 CT7 syllabus and therefore there are past exam questions to study.

1.3   Reading

Task	√*when completed*
Read Chapter 1, pages 7–18.	☐

1.4   Checklist

Task	√ *when completed*
Ensure that you can:	

Ensure that you can:

- define the following key terms:

  - production   ☐
  - consumption   ☐
  - factors of production (or resources)   ☐
  - labour   ☐
  - land and raw materials   ☐
  - capital   ☐
  - scarcity   ☐
  - macroeconomics   ☐
  - microeconomics   ☐
  - aggregate demand   ☐
  - aggregate supply   ☐
  - inflation   ☐
  - balance of trade   ☐
  - recession   ☐
  - unemployment   ☐
  - demand-side policy   ☐
  - supply-side policy   ☐
  - opportunity cost   ☐
  - rational choices   ☐
  - marginal costs   ☐
  - marginal benefits   ☐
  - rational decision making   ☐
  - economic efficiency   ☐
  - productive efficiency   ☐
  - allocative efficiency   ☐
  - equity   ☐
  - production possibility curve   ☐
  - increasing opportunity costs of production   ☐
  - investment   ☐
  - barter economy   ☐
  - market   ☐

- describe the two main macroeconomic concerns, *ie* full
  employment of resources and growth.   ☐

Task	√*when completed*
Continued:	
Ensure that you can:	
• describe the three main microeconomic choices that have to be made by an economy because resources are scarce	☐
• draw a production possibility curve and explain why it is a curve rather than a straight line	☐
• use a production possibility curve to demonstrate:	
– choice and opportunity cost	☐
– increasing opportunity cost as output of one product increases	☐
– output at less than the economy's full potential	☐
– growth in the economy's potential output.	☐

1.5   Questions

Question

Amy is deciding how to spend next Saturday afternoon. She has four mutually exclusive choices, which will give her the following units of pleasure:

1.   driving in a car rally   + 70

2.   playing squash   + 40

3.   watching television   + 25

4.   going shopping   + 15

(i)   What is the opportunity cost of driving in a car rally?

(ii)   What is the opportunity cost of going shopping?

Solution

(i)   The opportunity cost of driving in a car rally is +40 units of pleasure, which is the value in terms of units of pleasure forgone by not playing squash (the best alternative).

(ii)   The opportunity cost of shopping is +70 units of pleasure, which is the value in terms of units of pleasure forgone by not driving in a car rally (the best alternative).

Question

A country produces Good X and Good Y only. The table gives maximum production possibilities for Goods X and Y.

Point	Units of Good X	Units of Good Y
A	0	15
B	1	13
C	2	10
D	3	6
E	4	0

(i)   Draw a production possibility curve marking points A, B, C, D and E.

(ii)   Calculate the opportunity cost of increasing the output of Good X from 2 to 3 units.

(iii)   Explain how and why the opportunity cost of producing higher levels of output of Good X changes.

(iv)   Describe the situation that must exist if the economy produces a combination of 2 units of Good X and 8 units of Good Y.

Solution

(i)
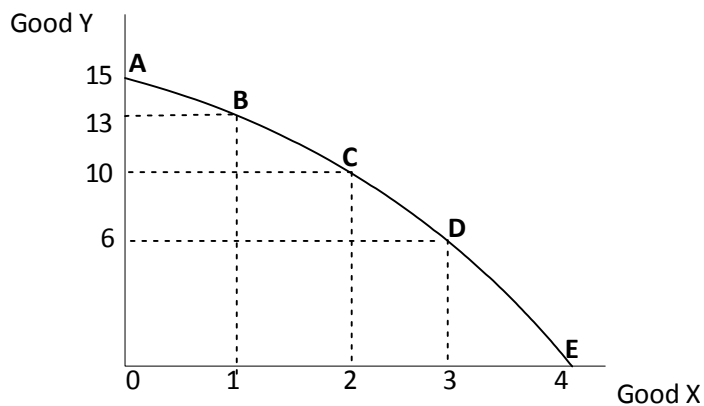
(ii)   The opportunity cost of increasing output of Good X from 2 units to 3 units is the 4 units of Good Y that would have to be foregone.

(iii)   The opportunity cost of producing an extra unit of Good X increases from 2 to 3 to 4 to 6 units of Good Y as the output of Good X increases from 0 to 1, 1 to 2, 2 to 3 and 3 to 4. This is because costs increase as more of Good X is produced as the additional factors of production brought in to produce the extra output are less and less productive.

(iv)   If the economy is producing 2 units of Good X and 8 units of Good Y, it is producing inside its production possibility curve. This means that it is producing *less* than its full potential, either because its resources are unemployed or underemployed, or because the economy is not working as efficiently as it could.

2 Different economic systems

2.1 What's included in this section

- The classification of economic systems

- The command (or planned or centrally controlled/planned) economy

- Assessment of the command economy

- The free market economy

- Assessment of the free-market economy

- The mixed economy

2.2 Guidance

As a guide to the reading, the following might be of help:

- It is useful to analyse the way in which the two extreme economic systems work (the command economy and the free market economy) so that we can understand why most economies in the world are mixed, (*ie* economies where economic decisions are made partly by the government and partly through the market).

- Figure 1.6 on page 19 of the textbook arranges a number of economies along a spectrum ranging from those with most government intervention in the economy to those with least, and is a nice illustration of the variation that exists worldwide and how it is changing over time.

- Most of the course is about the free market economy and the need for government intervention, so:

    – the workings of the free market economy and reasons for its failures are covered in more detail in later modules

    – we will do no more work on the command economy after this module, except for a brief description of the philosophy and history of command economies in the section on Marxian socialism in Module 2.

- This topic is new to CB2, but it was in the pre-2010 CT7 syllabus and therefore there are past exam questions to study.

2.3 Reading

Task	√*when completed*
Read Chapter 1, pages 18–27.	☐

2.4   Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– centrally planned or command economy	☐
– free market economy	☐
– mixed economy	☐
– informal sector	☐
– subsistence production	☐
– input-output analysis	☐
– price mechanism	☐
– equilibrium	☐
– equilibrium price	☐
– mixed market economy	☐
– relative price	☐
• describe how the following economies allocate resources and distribute output:	
– command economy	☐
– free market economy	☐
– mixed economy	☐
• explain the interdependence of goods and factor markets	☐
• discuss the advantages and disadvantages of a:	
– command economy	☐
– free market economy.	☐

2.5   Questions

Question

Organise the statements in the box into:

(i)   Advantages of a command economy   (ii)   Disadvantages of a command economy

(iii)   Advantages of a free market economy (iv)   Disadvantages of a free market economy

(a)	The inputs and outputs of each industry can be matched so that the planned demand for each industry's output is equal to its planned supply.
(b)	The economy can respond quickly to changes in demand and supply conditions.
(c)	Monopolies that charge high prices and make large profits might develop.
(d)	Complex plans will be costly and bureaucratic.
(e)	Competition helps to increase efficiency.
(f)	Some goods and services would not be produced, *eg* the army.
(g)	The distribution of goods and services produced might be on the basis of need or contribution to the economy.
(h)	There might be a loss of individual liberty, *eg* in the choice of job.

Solution

(i)   (a), (g)

(ii)   (d), (h)

(iii)   (b), (e)

(iv)   (c), (f)

Module 1 Practice Questions

1.1   The problem of scarcity in economics:

Exam style

A   exists only in economies which rely on the market mechanism.

B   could be eliminated if we force prices to fall.

C   means that there are shortages of some goods.

D   exists because there are insufficient resources to satisfy human wants.   [1½]

1.2   An economy can produce either Good X or Good Y. The opportunity cost of producing an extra unit of Good X is:

Exam style

A   the value of the capital and labour used to produce Good X.

B   the number of units of Good Y that must be given up in order to produce an extra unit of Good X.

C   the cost of producing Good X less the cost of producing Good Y.

D   the amount of Good X that would have been produced in the following year.   [1½]

1.3   Define the two branches of economics: macroeconomics and microeconomics.   [2]

Exam style

1.4   Describe and discuss the scope of economics in terms of the problems of the allocation of scarce resources.   [5]

Exam style

1.5   Explain the differences between a command economy and a free market economy.   [10]

Exam style

The solutions start on the next page so that you can
separate the questions and solutions.

Module 1 Solutions

1.1 *This question is Subject CT7, September 2014, Question 2.*

Option D. The definition of *scarcity* is 'the excess of human wants over what can actually be produced to fulfil these wants'.   [1½]

1.2 Option B. The definition of *opportunity cost* is the cost 'in terms of the best alternative foregone'. In this case, it is the amount of Good Y that would have to be given up to produce the extra unit of Good X.   [1½]

1.3 *This question is Subject CT7, September 2015, Question 27*.

Macroeconomics is concerned with the economy as a whole and studies economic aggregates, such as national income, unemployment and the general level of prices.   [1]

Microeconomics is concerned with individual parts of the economy (*eg* households, firms and industries) and the way they interact to determine the pattern of production and distribution of goods and services.   [1]
[Total 2]

1.4 *This question is Subject 107, September 2002, Question 27 (amended).*

There are two main approaches that economists use to tackle the problem of scarcity:

1.   At a macro level, the available resources should be fully and efficiently employed so that the full potential output is achieved and, over time, increased.   [1]

2.   At a micro level, rational choices must be made concerning the precise use of the resources so that an efficient and fair allocation of those resources is achieved.   [1]

The key microeconomic questions are:

–   What goods and services should be produced and in what quantities? The economy does not want to waste its resources producing goods that people do not want to buy. The opportunity cost must be considered. For example, if more nuclear weapons are produced, there might be fewer hospitals built.   [1]

–   How should the goods and services be produced? For example, should the goods be produced in a labour-intensive way or a capital-intensive way?   [1]

–   Who should receive the goods and services once they are produced? Should they be rationed or should people be free to spend their income as they wish? If the latter, the economy must consider how incomes are to be determined.   [1]
[Total 5]

1.5 *This question is Subject 107, September 2001, Question 32 (amended)*

Command economy

In a command economy, the state plans the allocation of resources, the plans being based on an estimation of people's wants and needs, the availability of resources and the state's priorities. [1]

Firstly, at a macro level, it decides on the balance between the production of investment goods (*eg* machinery, infrastructure) and consumer goods (*eg* food, clothing, cars). Investment goods will stimulate economic growth but the opportunity cost is the current consumption that will be foregone. [1]

Secondly, at a micro level, it plans the output of each industry and firm, the techniques that will be used and the resources that will be required. For example, the steel industry will be given a target output (which will be needed for various industries, *eg* the car industry) along with the required inputs (such as labour, coal, iron ore *etc*). [1]

The state uses input-output analysis to show the sources of all inputs and the destination of all outputs so that the overall demand for an industry's output will be equal to its supply. [1]

The state also plans the distribution of the output of goods and services produced. The state might decide to use direct rationing or it might allow individuals to earn an income (determined by the state itself) and have some choice about the goods and services consumed. [1]

The distribution policy will be determined by its aims. It might distribute on grounds of people's needs, or it might wish to reward those who produce more. [1]

Free market economy

In a free market economy, there is no government intervention; instead resources are allocated to different uses by the price mechanism. [1]

The wishes of consumers and producers are reflected in the market forces of supply and demand, which together, determine prices and determine resource allocation. [1]

For example, if there's an increase in the demand for cars, the price of cars will increase, the profits from car production will increase and firms will produce more cars. [1]

Markets also determine the production techniques used (*eg* labour-intensive or capital-intensive) because firms will consider the cost of resources and their productivity and choose a method of production that minimises costs. [1]

The distribution of the output of goods and services is determined by the distribution of income, and income is determined by market forces. For example, if there's an increase in the demand for car mechanics, the wages of car mechanics will increase, and therefore they will be able to afford to buy more of the goods and services that have been produced by the economy. [1]

[Maximum 10]

2

Main strands of economic thinking

Syllabus objectives

1.2   Assess the main strands of economic thinking:

- classical

- Marxian socialism

- neoclassical, Keynesian, neo-Keynesian and post-Keynesian

- monetarist

- Austrian.

Core reading

Chapter 12, Box 12.7   *Pages 388–389*

Chapter 16   *Pages 492–516*

Additional Core Reading

The textbook references given above are required for this syllabus objective but they assume background knowledge, which we will not cover until later in the course, so reading the textbook is not required at this stage. These references will be given again when the topics are covered in detail later in the course. For the moment, a short summary of each school, incorporating the Additional Core Reading, will be given and will be sufficient.

0   Introduction

Economics is an evolving subject. Theories and economic models are suggested by economists and are used to explain and predict outcomes. They are tested in the real world and if they fail to explain or predict outcomes reasonably accurately they might be abandoned or amended. Interestingly, some theories might make accurate predictions in some societies and not in others; or might make accurate predictions for a certain period of time but then seem to fail. This is because theories have to make assumptions about how individuals and groups behave in certain situations. Human behaviour depends on the environment in which an individual lives, and over time this can change.

In this module, an outline of the main schools of thought is presented. Further details on some of the schools of thought are given at relevant places throughout the course.

Although some of the individual theories of some of the schools of thought have been discussed in previous syllabuses, the Subject CB2 syllabus gives a more complete picture of the range of schools of thought and greater emphasis to the development of economic thought.

This module is presented slightly differently from the others. Since the textbook reading is not covered until later in the course, this module contains only ActEd Course Notes and additional Core Reading.

1 Main strands of economic thinking

1.1 What's included in this section

- A timeline showing the development of economic thinking

- ActEd Course Notes and Core Reading on:
  – the classical approach
  – Marxist socialism
  – the neoclassical approach
  – Keynesian schools of thought
  – the monetarist approach
  – the new classical approach
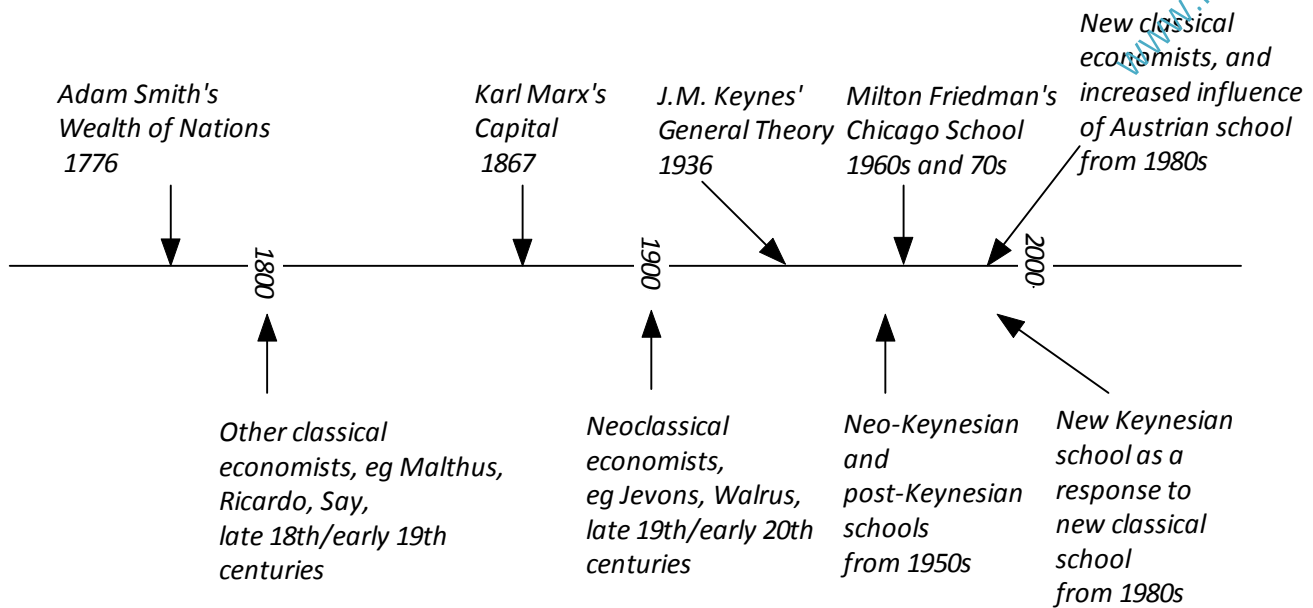 – the Austrian school

1.2 Guidance

This is an introduction to the schools of thought that are covered in this course and a reference that can be consulted throughout the course.

In the checklist that follows the descriptions of each school, priority has been given to the concepts and issues that are not likely to be referred to in subsequent modules.

1.3 Reading

Task	√*when completed*
Read the following ActEd Course Notes and Core Reading.	☐

1.4   A timeline

Adam Smith's Wealth of Nations 1776

Karl Marx's Capital 1867

J.M. Keynes' General Theory 1936

Milton Friedman's Chicago School 1960s and 70s

New classical economists, and increased influence of Austrian school from 1980s

Other classical economists, eg Malthus, Ricardo, Say, late 18th/early 19th centuries

Neoclassical economists, eg Jevons, Walrus, late 19th/early 20th centuries

Neo-Keynesian and post-Keynesian schools from 1950s

New Keynesian school as a response to new classical school from 1980s

1.5   The classical approach

Adam Smith is regarded as the founding father of classical economics. He argued that a free market economy, in which individuals acted in their own self-interest, would bring about maximum social benefit. He said that intervention by the state would generally reduce the nation's wealth, though he did support some state intervention for the common good, especially in the control of monopoly power.

Other classical economists supported the free market economy too, though there were some who were concerned that the capitalist system could result in unemployment. The views of these dissenters were dismissed for over 100 years, largely because the 19th century saw the mainly free market economy delivering growing output and low unemployment. Classical economists believed that even if unemployment did occur there was an automatic self-regulating mechanism that would return the economy to a full-employment level of output.

Classical economists (who were then called political economists) were mainly interested in the process of wealth creation and the distribution of income among the classes (workers, landlords and capitalists). They argued that wealth could be increased by specialisation and trade, and argued among themselves about the contribution that each of the classes made to output.

From their work on production, they concluded that the value of a product is determined by its cost of production, *ie* the value of the resources used in its production. However, this theory was never fully developed and was later largely displaced by the subjective theory of value of the neoclassical economists. They believed that a product's value to a consumer depends on the consumer's wants and needs. Alfred Marshall built on these two strands and developed the equilibrium model in which price is determined by supply and demand.

A detailed explanation of the classical approach to macroeconomics is covered in Module 16.

1.6   Marxist socialism

An early economist advocating a fully planned economy was Karl Marx. In his book *Capital* in 1867, Marx used the labour theory of value to argue against capitalism.

According to the theory of value, the value of a product is determined by the number of hours of labour used to produce the product. Marx argued that the theory can explain the value of all commodities including the commodity that workers provide and he called this 'labour power'. This is the number of hours of work that is sufficient to sustain the workers and is the long-run wage rate. For example, if it takes six hours of labour per day for a worker to earn enough to afford his living expenses, and if one hour of work is equivalent to £1, then the wage rate would be £6 per day.

Labour power is the combination of mental and physical capabilities that an individual has. This labour power can be sold to an employer in exchange for a wage. Marx argued that in a capitalist system, the value of labour power (the wage or the cost to an employer) is equal to is the minimum necessary for the survival of the working class, *ie* the subsistence necessary for the maintenance of life. What items are actually included in 'a worker's necessary living expenses' are the product of historical development and depend on the situation and conventions in the country.

However, Marx argued, the owners of capital make the workers work in excess of what is necessary to sustain them; workers could work 10 hours but are paid £6. The surplus value, which is the difference between the total revenue and cost, is enjoyed by the owners of capital.

Surplus value is therefore equal to the value of the output workers have produced in excess of their own labour cost.

Further, Marx predicted that competition amongst the capitalists would drive most capitalists out of the market and into the labour market and create monopolies. Eventually the workers would gain enough power to dismantle the whole system. A socialist system was an inevitable outcome. The message was adopted by political movements and socialist regimes were formed, notably the Soviet Union in 1922.

1.7   The neoclassical approach

The neoclassical approach was developed in the 19th century by economists such as Jevons and Walrus. Their approach was mainly concerned with marginal utility, consumer rationality and maximisation of utility as the main objective of consumers.

Utility means satisfaction. *Marginal utility* is the additional satisfaction from consuming an additional unit of the product.

According to this approach, competition in an economy leads to efficient allocation of resources by balancing supply and demand, where equilibrium is established. Many of the tenets of this approach form the basis of modern economics. Also, whereas classical economists believed that the value of a product derived from the cost of its production, the neoclassical view is that the price of a product depends on consumers' perception of its value.

The neoclassical approach and its assumption of rationality has come under criticism after the financial crisis of 2008.

The neoclassical approach is discussed in detail throughout the course, particularly in microeconomic theory.

1.8   Keynesian schools of thought

The classical theory assumed that price adjustments in a free market would balance supply and demand and clear the markets. Markets, they argued, may experience periods of disequilibrium but, in the long run, markets clear. However this micro approach to the operation of markets could not explain persistent unemployment in the economy in the 1930s.

Keynes offered new ideas in an attempt to explain the causes of the Great Depression of the 1930s. He emphasised adjustments in the aggregate supply in the short-run, the effect of business confidence on markets and the importance of governments' macroeconomic policy intervention to stimulate demand.

Since the publication of Keynes' book, the *General Theory of Employment, Interest and Money*, three main schools of thought have emerged that attempt to explain Keynes' ideas: neo-Keynesians, new Keynesians and post-Keynesians.

A detailed explanation of Keynesian theory will be covered in Module 16.

Neo-Keynesians

The neo-Keynesian school of thought formed the mainstream economics in the 1950s, 1960s and 1970s. The focus of this approach was on macroeconomic models of the economy incorporating Keynes' ideas. John Hicks' *IS-LM* model is an example.

However this approach was criticised on the grounds that such models, once built, do not allow for changes in the economic environment and government policy, or for the sometimes unpredictable behaviour of economic agents.

The neo-Keynesian synthesis of Keynesian theory with neoclassical theory is known as the neoclassical synthesis.

Neo-Keynesians attempted to explain why, according to theory, equilibrium may not be reached in markets. They offered explanation in terms of imperfections in competitive markets and factors (such as wage rigidity) which could result in prices, interest rates and wages remaining at a level incompatible with those needed to establish equilibrium.

Neo-Keynesians argued that if full employment was not naturally achieved, government could intervene to ensure full employment. The post-World War II period was marked by low unemployment and inflation in the Western economies. However in the 1970s, the appearance of stagflation, a combination of high unemployment and high inflation, questioned the validity of neo-Keynesian ideas.

The neo-Keynesian *IS-LM* model is discussed in detail in Module 18.

Post-Keynesians

The post-Keynesian group of economists believes that Keynes has been misrepresented by the neo-Keynesian and new Keynesian groups. They go back to Keynes' original work and highlight some of the key features of that to explain why economies experience unemployment. In particular, they stress the critical role of confidence (or what Keynes called 'animal spirits'). For example, when faced with a reduction in demand, a business might not reduce prices as neoclassical theory suggests, but instead reduce investment, output and employment.

The post-Keynesian economists are part of a group known as *heterodox economists*, which also includes the Austrian school of economists discussed below. Heterodox economists reject the assumptions of neoclassical economics, in particular the assumption of rational optimising behaviour. They believe that people are unable to form rational expectations and that it is very difficult to make predictions. Decisions are therefore hampered by uncertainty and post-Keynesian economists highlight the importance of understanding the various influences on institutional and human behaviour.

The post-Keynesians have worked on many areas of economics, including growth, trade, development and income distribution. Although outside mainstream economics, their views on some matters have been very influential. For example, their view that interest rates rather than the money supply should be the instrument of monetary policy has been largely accepted; and their theory of financial instability has received renewed attention since the financial crisis of 2008.

New Keynesians

In the 1980s, in response to the new classical approach (and its faith in continuous market clearing), a group of economists (now known as new Keynesians), adopted a microeconomic approach and investigated market imperfections. They sought to explain how market imperfections and frictions can result in fluctuations in output and the persistence of unemployment. For example, prices might not respond immediately to a demand shock because of the costs involved in changing price lists and negotiating prices with suppliers; and wages might be above the market rate because firms want to provide an incentive for workers to work hard.

The views of new Keynesians are discussed in Module 17.

Various aspects of the Keynesian approaches are discussed in detail throughout the course in the chapter references provided.

1.9   The monetarist approach

For a period of about thirty years after the Second World War, the Keynesian policy of demand-management became the accepted practice of governments. However, the Keynesian orthodoxy began to break down in the 1960s and 1970s as economies experienced higher levels of unemployment and inflation. This experience led to a reassessment of macroeconomic theory and policy.

The monetarist school was led by Milton Friedman of Chicago University. He returned to an old classical theory (the quantity theory of money) to explain that inflation was caused by too great an increase in the money supply, and suggested that governments should keep the money supply under tight control. If the government set and published targets for the growth of the money supply, this would help to reduce expectations of inflation. Margaret Thatcher in the UK and Ronald Reagan in the US became strong supporters of monetarism.

So, inflation became the major concern of governments and unemployment was allowed to rise if that was a consequence of the tight controls on the money supply. However, the monetarists argued that the negative effect on unemployment would be short-lived, because they believed that in the long term, as individuals adapted to the new conditions, the level of employment would return to its natural rate. So, like the classical economists, they believed that the market economy could deliver macroeconomic stability.

A detailed explanation of the monetarist approach is covered in Module 17.

1.10   The new classical approach

Whereas the monetarist school believes that individuals take time to adapt their expectations to new conditions, the new classical school believes firstly, that individuals use all available information to form rational expectations, and secondly, that all markets are continuously clearing. This would mean that any change in the money supply (or any other factor affecting aggregate demand) would have an immediate effect on prices and wages and no effect on output and employment.

If the new classical economists believe that changes in aggregate demand have no effect on output, there must be some other explanation of changes in output. The key accompanying element in the thinking of the new classical school is the real business cycle theory. According to this, supply-side shocks, especially technology shocks, permanently affect the economy's growth path.

A detailed explanation of the new classical approach is covered in Module 17.

1.11   The Austrian school

The approach of the Austrian school deviates from the neoclassical school because of its focus on disequilibrium. This is important in business generally, but particularly finance. The main features of the Austrian school are discussed below.

The process of competition

Followers of the Austrian school believe that information about preferences of consumers and about costs of different ways of producing goods and services is subjective and dispersed; different people have different preferences that cannot be known by government, making successful central planning of the economy impossible. These preferences may be complex and not necessarily rational in the conventional sense.

For example, they argue, a customer might have a preference to buy a product from a mutually-owned insurance company even if the product is more expensive and in other respects identical. Economists following the Austrian school believe that the market process reveals these preferences and, as such, competition and entrepreneurship within the context of a market is necessary to promote the welfare of society as a whole.

It cannot be known in advance whether different ways of producing goods and services will be cheaper or satisfy consumers better. However, the process of competition will ensure that efficient firms that innovate and produce goods that are valued by customers will prosper. Preferences and the costs of different methods of production are continually changing, so the Austrian school's focus is on competition to reveal preferences and efficient business practices, rather than placing the emphasis on modelling equilibrium outcomes. These economists believe that businesses will pursue many ideas and ventures because of the uncertain environments in which they operate. It is only in retrospect that success or failure can be identified. As a result, the Austrian school of thought focuses on the importance of 'uncertainty', which cannot be quantified, as well as 'risk' which can be quantified.

Government intervention

The Austrian school does not support government regulation that directs economic activity in particular ways – including in the financial sector. In general, they would not approve of the regulation of products or risk management in financial institutions. They argue that successful regulations cannot be known in advance; they offer as an example the financial crisis of 2008 to demonstrate that many forms of government regulation could have the opposite of their intended effect. However, they generally do believe that the government should provide a framework of law, for example, to enforce contracts and to prevent fraud.

Economists following the Austrian school also believe that systems of regulation evolve within the market itself. For example, they point to stock exchanges such as those in Amsterdam, New York and London that regulated the securities markets before the governments took over the regulatory role. They point to the UK, where many of the functions of securities market regulation passed to government bodies as recently as 1986, and the US, where this process took place in the early 1930s. This school, therefore, emphasises the role of the market rather than the government in regulation.

Followers of the Austrian school believe that central banks' pursuit of a monetary policy that is too loose, would lead to the distortion of the economy and inflation. They argue that low interest rates, for example, cause an unsustainable investment boom which will correct itself (possibly with damaging consequences) when the boom comes to an end. Other schools of thought do not place the same emphasis on these processes.

1.12 Checklist

Task	√ when completed
Ensure that you can:	
• define the following key terms:	
– surplus value	☐
– labour power	☐
– heterodox economists	☐
• describe Marx's labour theory of value	☐
• explain why Marx predicted the collapse of capitalism	☐
• explain why the Austrian school:	
– believes central planning would be impossible	☐
– places little weight on modelling equilibrium outcomes	☐
• give an example of irrational behaviour and explain how, according to the Austrian school, the market can cope with irrational behaviour	☐
• explain the Austrian school's view of government intervention in the form of:	
– providing a legal framework	☐
– regulation	☐
– monetary policy.	☐
NB As pointed out in the Guidance section, in this checklist priority has been given to the concepts and issues that are not likely to be referred to in subsequent modules.	

1.13 Questions

Question

Karl Marx predicted that the capitalist system would collapse because:

A   the value of a product is determined by the number of labour hours involved in its production.

B   employers exploit workers and pay them less than the value of their output.

C   the capitalist system leads to extremes of wealth and poverty.

D   firms are taken over by other firms, capitalists enter the labour market and the labour force grows powerful enough to overthrow the system.

Solution

Option D. Marx believed that Options A, B and C are also true, but these would not, of themselves, cause the capitalist system to collapse.

Question

Match the school of thought (A to J) with beliefs (1 to 10).

A	Classical	1	the price of a product depends on the value that a consumer places upon it
B	Neoclassical	2	government management of demand
C	Marxian socialism	3	stress the role of confidence
D	Keynes	4	targets for money supply growth
E	Neo-Keynesian	5	the value of a product is determined by the resources used in its production
F	Post-Keynesian	6	rational expectations
G	Monetarist	7	market imperfections and rigidities
H	New classical	8	the development of macroeconomic models based on Keynes' work
I	New Keynesian	9	competitive markets cope with unusual and frequently changing preferences
J	Austrian	10	surplus value

Solution

A	5		F	3
B	1		G	4
C	10		H	6
D	2		I	7
E	8		J	9

Question

Which of the following are views of the Austrian school?

I   Governments should control the money supply so as to avoid distortions of the economy and inflation.

II   Supply-side shocks are a key influence on economic growth.

III   Self regulation of markets is preferable to government regulation.

A   I only
B   I and II only
C   I and III only
D   I, II and III

Solution

Option C. The second statement is a key element of the new classical school.

Module 2 Practice Questions

2.1 Which of the following schools of thought believes that the free-market economy will NOT automatically recover from a recession?

Exam style

A   classical
B   new classical
C   Keynesian
D   monetarist   [1½]

2.2 Which two schools of economists are regarded as heterodox economists?

Exam style

A   Austrian and post-Keynesian
B   monetarist and neo-Keynesian
C   classical and post-Keynesian
D   Austrian and new classical   [1½]

2.3 According the Marxist theory of value, the value of a product is determined by the:

Exam style

A   ratio of labour to capital in the production process.
B   number of hours of labour used to produce the product.
C   marginal product of labour.
D   quantity of capital plus quantity of labour employed.   [1½]

2.4 Which of the following statements is correct in relation to the Austrian school of economic thought?

Exam style

The Austrian school:

A   focuses on the role of uncertainty.

B   believes that consumers always behave rationally and their preferences can be modelled.

C   recommends greater regulation.

D   believes that monetary policy can always be used successfully to reduce interest rates resulting in full employment and low inflation.   [1½]

The solutions start on the next page so that you can
separate the questions and solutions.

Module 2 Solutions

2.1   Option C. Keynes believed that there is no reason to suppose that the free-market economy will automatically settle at a level of output that is sufficient to generate enough jobs for everyone that wants one. He said that the government should manage the level of aggregate demand in the economy so that it is sufficient to generate full employment.   [1½]

2.2   Option A. Heterodox economists are those who reject neoclassical equilibrium analysis, especially assumptions of rational optimising behaviour. Post-Keynesian and Austrian economists focus on the difficulty of making decisions in conditions of uncertainty.   [1½]

2.3   *This question is Subject CB2, Specimen exam paper 2019, Question 24.*

        Option B. This is the basis of Marx's labour theory of value.   [1½]

2.4   *This question is Subject CB2, Specimen exam paper 2019, Question 25.*

        Option A. The Austrian school believes that economists must focus on the uncertain environment in which businesses operate.   [1½]

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3

Supply and demand (1)

Syllabus objectives

2.1   Discuss the workings of competitive markets.

    1.   Discuss how markets operate.

        •   Explain the role of the price mechanism in a free market.

        •   Discuss the behaviour of firms and consumers in such markets.

    2.   Describe the factors that influence market demand and supply.

    3.   Describe and discuss how market equilibrium quantity and price are achieved.

    4.   Discuss how markets react to changes in demand and supply.

Core Reading

Chapter 2 (Sections 1, 2 and 3)   Pages 34–56

0   Introduction

Many economic decisions are made in markets that bring together buyers (consumers) and sellers (firms). This and the following modules consider the behaviour of firms and consumers and the way in which markets operate.

In this module, we bring together the market forces of demand, which reflects the wishes of the consumers, and supply, which reflects the wishes of the producers, to determine the equilibrium market price and quantity. This mechanism for allocating resources between different uses is called the *price mechanism*, or as Adam Smith called it, an 'invisible hand'.

Section 1 considers the factors that affect demand and Section 2 considers the factors that affect supply. Common to both is the influence of price. Section 3 brings the two sides together to determine the equilibrium market price and quantity, and considers the effect of changes in demand and supply on the equilibrium price and quantity.

This material is not new to Subject CB2 and was examined frequently in Subject CT7.

1   Demand

1.1   What's included in this section

- The relationship between demand and price

- The demand curve

- Other determinants of demand

- Movements along and shifts in the demand curve

1.2   Guidance

As a guide to the reading, the following might be of help:

- It is very important to remember and understand the difference between a *movement along* a demand curve and a *shift in* the demand curve. The former occurs when there is a change in the price of the good, and the latter occurs when there is a change in one of the other factors that affect demand.

- The list of factors affecting demand in the textbook is not exhaustive. For example, demand might also be affected by changes in the size and composition of the population, the availability and price of credit, and the weather. If an exam question asks for factors affecting the demand for a particular product, say a sports car, we should try to think of *specific* factors that would affect our willingness and ability to buy a sports car, *eg* rather than saying 'the number and price of complementary goods', we could specify 'the availability of credit to buy a sports car and the cost of insuring a sports car', and then we could go further and suggest alternative (non-bookwork) factors, such as the weather.

1.3   Reading

Task	√*when completed*
Read Chapter 2, *pages 35–42.*	☐

1.4   Checklist

Task	√ when completed
Ensure that you can:	
• define the following key terms:	
− price taker	☐
− the law of demand	☐
− income effect	☐
− substitution effect	☐
− quantity demanded	☐
− demand curve	☐
− substitute goods	☐
− complementary goods	☐
− normal goods	☐
− inferior goods	☐
− econometrics	☐
• explain why the quantity demanded falls when the price rises	☐
• draw individual and market demand curves	☐
• explain how demand functions can be estimated using regression analysis	☐
• describe six factors, other than price, that influence the demand for a good	☐
• distinguish between a change in demand and a change in the quantity demanded.	☐

1.5   Questions

Question

Consider the market for bicycles and explain the way in which the demand curve for bicycles would shift in response to each of the following scenarios:

(a)   Consumer incomes increase and some people will buy a mountain bike as well as a racer.

(b)   Consumer incomes increase and some people may now be able to afford a car and so may no longer need to buy a bicycle.

(c)   The price of cars increases and there is increased provision of cycle lanes on busy roads.

(d)   The price of bicycle helmets increases and the registration and licensing of bicycles is introduced.

(e)   People may increasingly believe that cycling is a fun, trendy and healthy thing to do.

Solution

(a)   If consumer incomes increase and some people will buy a mountain bike as well as a racer, the demand curve for bicycles would shift to the *right*.

(b)   If consumer incomes increase and some people may now be able to afford a car and so may no longer need to buy a bicycle, the demand curve for bicycles would shift to the *left*.

(c)   If the price of cars increases and there are more cycle lanes, more people may want to buy bicycles, so the demand curve for bicycles would shift to the *right*.

(d)   If the price of bicycle helmets increases and it is more expensive and cumbersome to own a bicycle, fewer people may want to buy bicycles, so the demand curve for bicycles would shift to the *left*.

(e)   If people increasingly believe that cycling is a fun, trendy and healthy thing to do, the demand curve for bicycles would shift to the *right*.

Question

If a fall in the price of Good X causes the demand curve for Good Y to shift to the right, then:

A   Good X and Good Y are complements.

B   Good X and Good Y are substitutes.

C   Good X is a normal good and Good Y is an inferior good.

D   Good X is an inferior good and Good Y is a normal good.

Solution

Option A. We have a fall in the price of Good X leading to an increase in the demand for Good Y. The goods are therefore likely to be *complements*, *ie* goods that are consumed together. For example, a fall in the price of cars is likely to lead to an increase in demand for cars and hence an increase in demand for petrol.

Question

If Good X is an inferior good, then an increase in income will cause a:

A   rightward shift of the demand curve for Good X.

B   leftward shift of the demand curve for Good X.

C   movement along the demand curve for Good X from left to right.

D   movement along the demand curve for Good X from right to left.

Solution

Option B. By definition, *inferior goods* are goods for which demand falls as income rises. This is shown as a leftward *shift* of the demand curve. Remember that a movement along a demand curve is caused by a change in price.

2 Supply

2.1 What's included in this section

- Supply and price

- The supply curve

- Other determinants of supply

- Movements along and shifts in the supply curve

2.2 Guidance

As a guide to the reading, the following might be of help:

- It is very important to remember and understand the difference between a *movement along* a supply curve and a *shift in* the supply curve. The former occurs when there is a change in the price of the good, and the latter occurs when there is a change in one of the other factors that affect supply.

- There are many factors other than price that affect supply. The textbook lists seven factors, and one of these (the costs of production) is subdivided into four further factors. In an exam, these could be listed as four separate points (although if the question only asked for four, it would be better to give a greater variety of factors). If an exam question asks for factors affecting the supply of a particular product, say potatoes, we should try to imagine ourselves as producers, and think of *specific* factors that would affect our willingness and ability to offer that product for sale, *eg* rather than saying 'the price of goods that are substitutes in supply' and 'government policy', we could specify 'the price of carrots' and 'the availability of subsidies for growing potatoes'.

2.3 Reading

Task	√*when completed*
Read Chapter 2, pages 42–45.	☐

2.4   Checklist

Task	√ when completed
Ensure that you can:	
• define the following key terms:	
– supply curve	☐
– substitutes in supply	☐
– goods in joint supply	☐
• give three reasons why quantity supplied increases with price	☐
• draw market supply curves	☐
• describe seven factors, other than price, that influence the supply of a good	☐
• distinguish between a change in supply and a change in the quantity supplied.	☐

2.5   Questions

Question

Consider the market for bicycles and explain the effect of each of the following scenarios on the supply curve for bicycles:

(a)   The cost of bicycle tyres may fall.

(b)   The price of unicycles may increase, increasing the opportunity cost of using skilled wheel makers to make bicycles.

(c)   A new process may be developed such that the amount of electricity needed to make a bicycle is reduced.

(d)   The government may make it illegal to use one of the chemicals previously used to make bicycles.

Solution

(a)   If the cost of bicycle tyres falls, and so the cost of producing bicycles also falls, the supply curve for bicycles would shift to the *right*.

(b)   If the price of unicycles increases, and hence the opportunity cost of using skilled wheel makers to make bicycles increases, the supply curve for bicycles would shift to the *left*.

(c)   If a new process is developed such that the amount of electricity needed to make a bicycle is reduced, the supply curve for bicycles would shift to the *right*.

(d)   If the government makes it illegal to use one of the chemicals previously used to make bicycles, the costs of production are likely to increase, in which case the supply curve would shift to the *left*.

Question

List four factors that affect the costs of production.

Solution

1.   Input prices, *eg* raw materials, wages, interest rates.

2.   Technology, *eg* developments in engineering and in computer hardware and software.

3.   Organisation of business, *eg* management techniques, organisation of production.

4.   Government policy, *eg* taxes, subsidies, regulations, legislation.

3   Price and output determination

3.1   What's included in this section

- Equilibrium price and output

- Movement to a new equilibrium

- Incentives in markets

- Identifying the position of demand and supply curves

3.2   Guidance

As a guide to the reading, the following might be of help:

- Many exam questions involve calculating the equilibrium price and quantity from equations for the demand and supply curves. The 'Looking at the Maths' box on page 48 does this by using general forms of the equations; it is generally much easier than this in practice, as the questions at the end of this section show.

- Many questions ask for the effect on price and quantity of various changes, *eg* a decrease in income, so it is important to know the main factors that cause changes in demand and changes in supply.

- When answering multiple-choice questions, it is often worth sketching the diagram to make sure that an answer makes sense – when two factors are changing at the same time, it can be difficult to work out the effect on the market without a diagram.

- When drawing demand and supply diagrams for short-answer and long-answer questions in the exam, it is important to draw fairly large, well-labelled diagrams, with clearly marked equilibrium positions.

- Boxes 2.2 and 2.3 provide two very useful and interesting case studies about house prices and stock market prices. Past exam questions have asked about the housing market and the stock market.

- Useful Threshold Concepts in this section are:

   – Threshold Concept 4, which explains what is meant by partial equilibrium

   – Threshold Concept 5, which discusses the need for incentives to be appropriate for the purpose and not to have any undesirable side-effects.

3.3   Reading

Task	*√when completed*
Read Chapter 2, pages 45–56.	☐

3.4   Checklist

Task	√when completed
Ensure that you can:	
• define the following key term:	
– market clearing	☐
• calculate the equilibrium price and quantity by equating demand and supply functions	☐
• draw diagrams to show the market equilibrium and the effect on the equilibrium price and quantity of:	
– an increase in demand	☐
– a decrease in demand	☐
– an increase in supply	☐
– a decrease in supply	☐
• give examples of:	☐
– financial incentives	☐
– non-financial incentives	☐
– perverse incentives	☐
• explain the problem of identifying the demand and supply curves from limited data, *ie* the identification problem.	☐

3.5   Questions

Question

Demand and supply conditions in a market are given by the following equations:

$$Q_d = 1300 - 4P$$

$$Q_s = 100 + 2P$$

where P is the price in $.

Calculate the equilibrium price and quantity sold.

Solution

Equating supply and demand:

$$Q_s = Q_d$$

$$100 + 2P = 1300 - 4P$$

$$6P = 1200$$

$$P = 200$$

Substituting $P = 200$ in either Q_s or Q_d, $Q_s = Q_d = 500$.

It doesn't matter which of Q_s or Q_d we substitute into, as Q_s and Q_d are, by definition, the same in equilibrium.
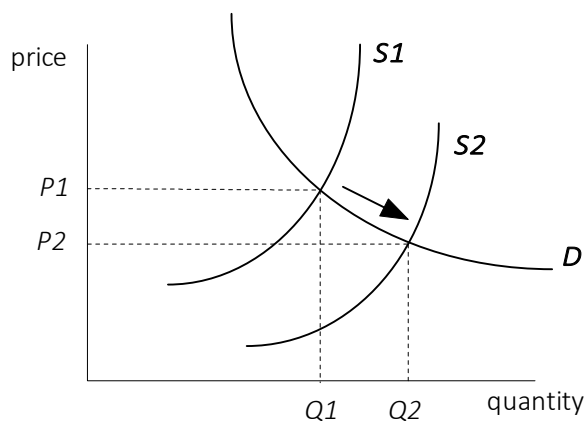
Question

Which of the following occurs when technological improvements occur, making a good easier to produce?

I   a movement along a demand curve
II   a shift of the supply curve
III   a movement along a supply curve

A   I and II
B   II and III
C   I only
D   III only

Solution

Option A. Improvements in technology reduce production costs, which causes the supply curve to shift to the right, leading to a movement along the demand curve.

Question

Demand and supply conditions in a market are given by the following equations:

$$Q_d = 200 - 3P$$

$$Q_s = 2P$$

where P is the price in £.

(i)   Calculate the equilibrium price and quantity sold.

(ii)   Determine the equation of the new supply curve if a tax of £5 per unit is imposed on suppliers.

(iii)   Calculate the new equilibrium price and quantity sold.

(iv)   Calculate the tax revenue.

(v)   Determine the amount of the tax (per unit) paid by the consumer and the producer.

Solution

(i)   Equating supply and demand:

$$Q_s = Q_d$$

$$2P = 200 - 3P$$

$$5P = 200$$

$$P = 40$$

Substituting in either Q_s or Q_d, $Q_s = Q_d = 80$.

(ii)   A tax of £5 imposed on the suppliers increases firms' costs, so the supply curve shifts vertically upwards by the amount of the tax (as firms require an extra £5 to cover the additional costs of supplying each unit of the good). The supply schedule becomes:

$$Q'_s = 2(P - 5) = 2P - 10$$

where P is the new market price.

This is because the producers are now basing their supply on $(P-5)$, since this is what they will have to cover their costs once they've received the price P from customers and paid £5 to the government.

(iii)   Equating the new supply function with demand:

$$Q_s' = Q_d$$

$$2P - 10 = 200 - 3P$$

$$5P = 210$$

$$P = 42$$

Substituting in either Q_s or Q_d, $Q_s = Q_d = 74$.

(iv)   Tax revenue $= £5$ per unit $\times 74$ units $= £370$.

(v)   The price has risen by £2. This means the consumer is bearing £2 of the tax and the producer is bearing £3 of the tax, *ie* the consumer is paying £2 more and the producer is receiving £3 less (£42 – £5).

The effect of the tax can be seen in the following diagram.
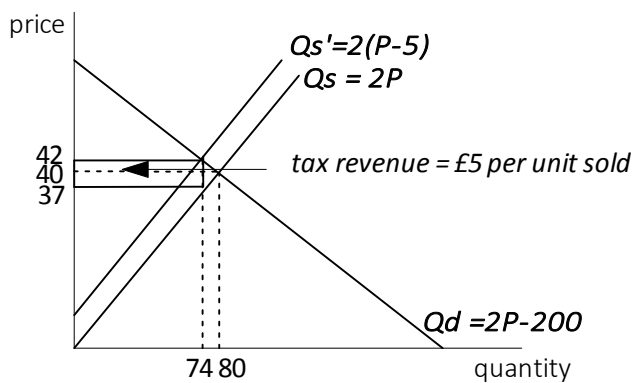
Question

If at all positive quantities, the upward-sloping supply curve lies above the downward-sloping demand curve, then:

A   the quantity traded will be zero.

B   the quantity traded will be infinite.

C   the market mechanism has failed and quantity must be determined by a central agency.

D   it is impossible to say what quantity will be traded in a free market.

Solution

Option A. As is sometimes the case, this is most easily seen by drawing a suitable diagram.
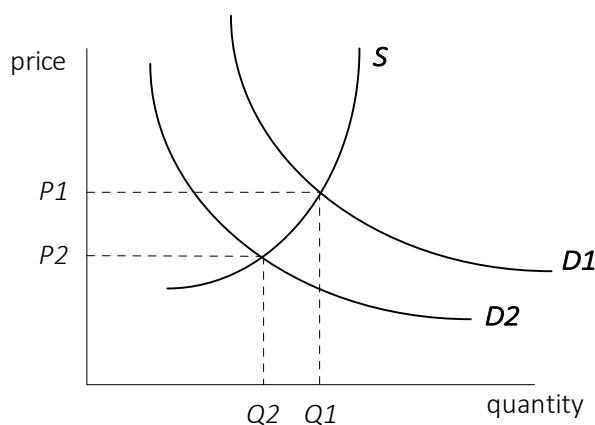
price

S

D
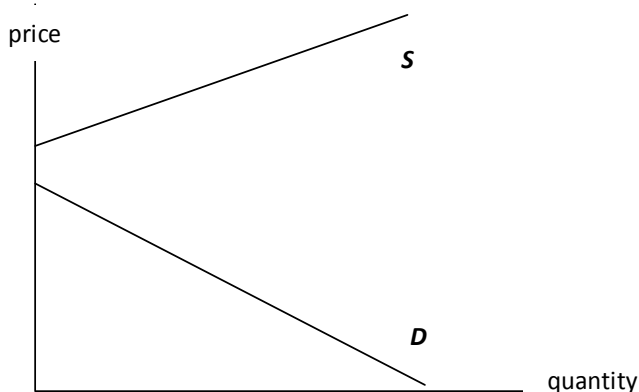
quantity

Question

Draw four separate supply and demand diagrams to show the effects of the following shocks on the equilibrium price and quantity sold of cars:

(i) a decrease in consumers' incomes

(ii) a rise in car insurance premiums

(iii) a rise in the wages of car workers

(iv) a government subsidy for car production.

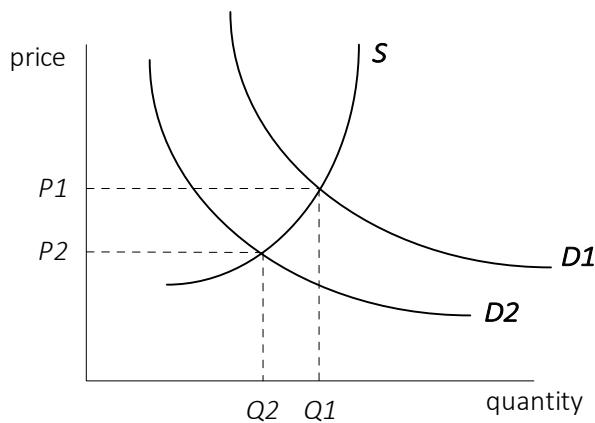## Solution

(i) *Decrease in consumers' incomes* (assuming cars are normal goods)
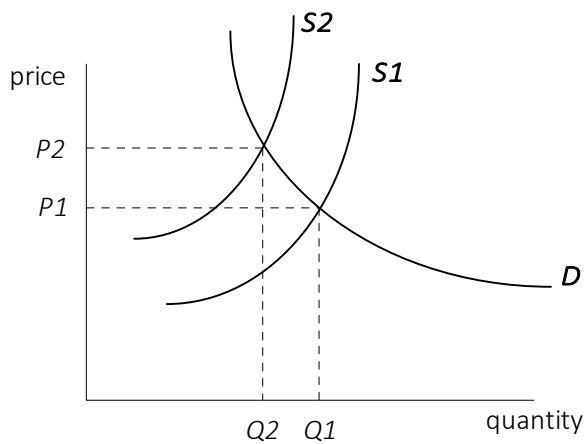
price

S

P1

P2

D1

D2

Q2 Q1 quantity

A decrease in income shifts the demand curve for a normal good to the left. Equilibrium price and quantity both decrease.

(ii)   *Rise in car insurance premiums* (assuming cars and car insurance are complements)


Cars and car insurance are *complementary goods*. An increase in car insurance premiums therefore shifts the demand curve for cars to the left. Equilibrium price and quantity both decrease.

(iii)   *Rise in the wages of car workers*

A rise in wages increases the costs of the car manufacturer. The supply curve shifts to the left. Price increases and quantity sold falls.

(iv)   *Government subsidy for car production*
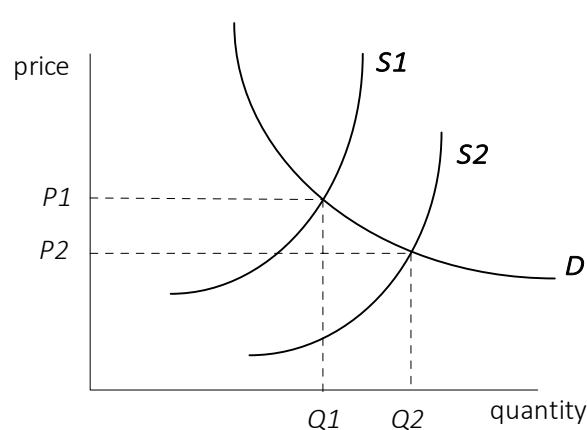
A subsidy reduces the cost of production. The supply curve shifts right (or vertically downwards by the amount of the subsidy). Price to the consumer falls to *P2* (but the producer receives *P2* plus the subsidy) and quantity sold increases.

*Note that explanations are not required since the instruction word is **draw** and not **explain**.*

Module 3 Practice Questions

3.1　A movement along a demand curve is best described as:

Exam style

A　a change in demand.

B　an increase in demand.

C　a decrease in demand.

D　a change in quantity demanded.　　　　　　　　　　　　　[1½]

3.2　Which one of the following events would shift the demand curve for Good X to the left?

Exam style

A　a decrease in the price of Good X

B　a decrease in the price of a substitute good

C　a decrease in the price of a complementary good

D　an increase in the cost of supplying Good X　　　　　　　　[1½]

3.3　Which one of the following will shift the supply curve for Good X to the right?

Exam style

A　a decrease in labour productivity in Industry X

B　a fall in the price of raw materials used to produce Good X

C　an increase in real wages in Industry X

D　a government sales tax on the production of Good X　　　　　[1½]

3.4　A consumer's demand curve for Good X is represented by the equation:

Exam style

$$Qd = 50 - 0.2p$$

where Qd is the quantity of Good X demanded and p is the price of Good X.

A producer's supply curve for Good X is represented by the equation:

$$Qs = 10 + 0.6p$$

where Qs is the quantity of Good X supplied and p is the price of Good X.

Demand and supply are in equilibrium when:

A　Q is 20 and p is 150

B　Q is 30 and p is 100

C　Q is 35 and p is 75

D　Q is 40 and p is 50　　　　　　　　　　　　　　　　　[1½]

3.5   Draw a separate diagram for each of the following events to illustrate the impact of the change on
       the equilibrium price and quantity sold of Good X.

       Good X is an inferior good. Before the introduction of the change, label the demand curve *D1*, the
       supply curve *S1* and price and quantity *P1* and *Q1* respectively. Label any new demand and supply
       curves *D2* and *S2* respectively and the new price and quantity *P2* and *Q2*.

       (i)   a rise in the price of a substitute Good Y   [1]

       (ii)   a government subsidy on the production of Good X   [1]

       (iii)   a fall in consumers' incomes   [1]

       (iv)   a fall in input costs in the industry that produces Good X   [1]
                                                                                       [Total 4]

3.6   If the price of a substitute good decreases and the cost of production decreases the price:
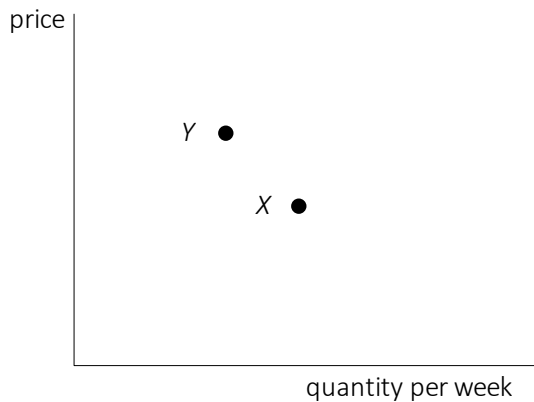
       A   will fall and the equilibrium quantity may rise or fall.
       B   will fall and the equilibrium quantity will rise.
       C   may rise or fall and the equilibrium quantity may rise or fall.
       D   may rise or fall and the equilibrium quantity will fall.   [1½]

3.7   In the diagram below, points X and Y represent the equilibrium price and quantity traded of a
       good in two successive time periods.

       Which of the following is NOT a possible explanation?

       A   An input in the production process became more expensive.

       B   The price of a close substitute for the good increased.

       C   An input in the production process became more expensive and the price of a close
               substitute increased.

       D   An input in the production process became more expensive and the price of a close
               substitute decreased.   [1½]

Module 3 Solutions

3.1   *This question is Subject CT7, April 2007, Question 3.*

Option D. A *movement along the demand curve* occurs as a result of a change in price, and is referred to as a change in quantity demanded. An increase in price would lead to a lower quantity demanded, and a decrease in price would lead to a higher quantity demanded. A *shift of the demand curve* occurs as a result of a change in one of the other factors that determine demand (*eg* income) and is referred to as an increase or decrease in demand. For example, an increase in income would lead to an increase in demand for a normal good (a shift to the right) and a decrease in demand for an inferior good (a shift to the left).   [1½]

3.2   Option B. The decrease in the price of a substitute good would lead to an increase in quantity demanded of the substitute good and therefore a decrease in demand for Good X (*ie* a leftward shift of the demand curve). For example, a decrease in the price of Pepsi would lead to a decrease in demand for Coca-Cola, assuming Pepsi is a substitute for Coca-Cola.   [1½]

3.3   *This question is Subject 107, April 2004, Question 2.*

Option B. A fall in the price of raw materials used to produce Good X will reduce the costs of producing Good X, so the producer will produce the same quantity for a lower price (or a higher quantity for the same price), and the supply curve will shift to the right. The other three options will add to the cost of supplying the good and so will cause the supply curve to shift to the left.

[1½]

3.4   *This question is Subject 107, September 2001, Question 12.*

Option D.

Equilibrium can be found where:

$$Q_d = Q_s$$
$$50 - 0.2p = 10 + 0.6p$$
$$0.8p = 40$$
$$p = 50$$

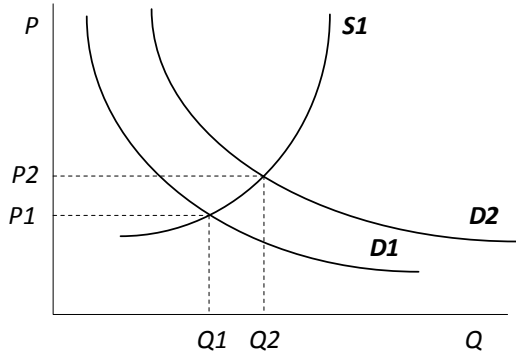Substituting back into either equation then gives:

$$Q = 40$$ [1½]
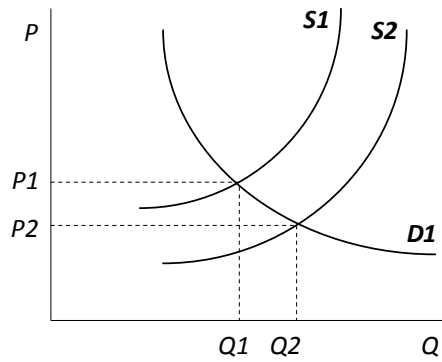
3.5   *This question is Subject CT7, September 2009, Question 29 (amended).*
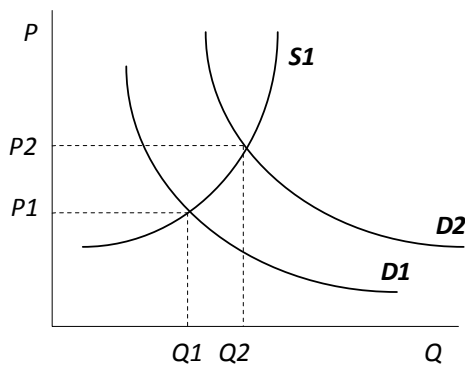
(i)   **A rise in the price of a substitute Good Y**

[1]

(ii)   **A government subsidy on the production of Good X**
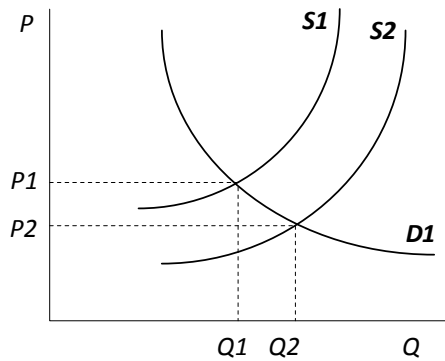

[1]

(iii)   **A fall in consumers' incomes**

Note that Good X is an inferior good.

[1]

(iv)   *A fall in input costs in the industry that produces Good X*

[1]

3.6   Option A. If the price of a substitute good falls, the substitute becomes more attractive, so the demand curve for this good will shift to the left. If the cost of production decreases, the supply curve will shift to the right. Therefore, the price will fall (because both events cause the price to fall). However, the effect on output is uncertain (because the decrease in demand would cause output to fall but the increase in supply would cause output to rise).   [1½]

3.7   *This question is Subject CT7, April 2006, Question 3.*

Option B.

A movement from X to Y represents an increase in price and a fall in quantity.

An input in the production process becoming more expensive will shift the supply curve to the left. This will increase price and reduce quantity. Therefore this, in conjunction with any other factor, *could* be a possible explanation. (This rules out Options A, C and D.)

An increase in the price of a close substitute will shift the demand curve to the right. This will increase both price and quantity. Therefore the answer is Option B.   [1½]

4

Supply and demand (2)

Syllabus objectives

2.1   Discuss the workings of competitive markets.

   5.   Define and calculate price and income elasticities of demand and price elasticity of supply.

      •   Calculate elasticities of demand using both original and average quantities.

   6.   Discuss the factors that affect elasticity.

   7.   Explain the effect of elasticity on the workings of markets in the short and long run.

   8.   Discuss how firms deal with risk and uncertainty about future market movements.

   9.   Describe price expectations and speculation and how price bubbles develop.

2.3   Discuss the importance of advertising for a firm.

   1.   Explain the effects of advertising on sales and demand.

Core Reading

0   Introduction

This module continues the study of supply and demand.

Sections 1 and 2 explore the topic of elasticity. In doing so, they cover the following measures of elasticity:

- price elasticity of demand
- price elasticity of supply
- income elasticity of demand
- cross-price elasticity of demand.

Elasticities measure the responsiveness of the quantity demanded or supplied to a change in one of the factors that influences demand or supply. Firms need to know about these elasticities in order to estimate the effect of changing market conditions on their revenues, costs and profits.

Section 3 considers how quickly markets adjust to a change in supply or demand, the impact of speculative activity and dealing with risk and uncertainty.

Finally, Sections 4 and 5 explore the impact on supply and demand of price controls and taxes and subsidies. These are important mechanisms by which governments can intervene in markets, which topic is covered in detail in Module 10.

There have been many examination questions on this material in the past.

1   Price elasticity of demand (PED)

1.1   What's included in this section

- Price elasticity of demand (PED)

- Measuring the PED

- Interpreting the figure for elasticity

- Determinants of PED

- PED and consumer expenditure

- The measurement of elasticity: arc elasticity

- The measurement of elasticity: point elasticity

1.2   Guidance

The textbook says that it is convention, when calculating PED between two points on a demand curve, to use the *average* or *mid-point* method. An alternative approach, not mentioned explicitly in the textbook, but required knowledge under Syllabus Objective 2.1.5 is the *original* method. Both methods are described below.

The 'Looking at the Maths' box explains that PED varies along a straight-line demand curve. This is an important concept that has been tested by the examiners. In particular, it is worth remembering that the PED is higher (in absolute terms) at points higher up the demand curve and is equal to –1 exactly halfway along it.

Box 2.4 explains the impact of advertising on the demand curve, as required by Syllabus Objective 2.3. This topic is not explained elsewhere in the textbook, but was examined in Subject CT7.

Box 2.6 shows how point elasticity can be calculated using calculus.

1.3   Reading

Task	*√when completed*
Read Chapter 2, pages 56–64.	☐
Read the following ActEd Course Notes.	☐

Arc elasticity

We can calculate arc elasticity (the PED between two points on a demand curve) using two different approaches.

The textbook suggests it is convention to use the *average* or *mid-point* method:

$$P\varepsilon_D = \frac{\Delta Q \,/\, average\ Q}{\Delta P \,/\, average\ P}$$

Syllabus Objective 2.1.5 states that Subject CB2 students also need to be able to calculate PED using the *original* method:

$$P\varepsilon_D = \frac{\Delta Q \,/\, original\ Q}{\Delta P \,/\, original\ P}$$

Questions employing both approaches are included in Section 1.5.

1.4   Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– price elasticity of demand (PED)	☐
– elastic / inelastic demand	☐
– unit elasticity of demand	☐
– total consumer expenditure on a product (*TE*)	☐
– total revenue (*TR*)	☐
– arc elasticity	☐
– point elasticity	☐
• state the general formula (in terms of percentage changes) for PED and the average (or 'midpoint') formula	☐
• interpret both the sign and value of PED figures	☐
• describe three determinants of the PED	☐
• explain the implication of different values of the PED for total revenue	☐
• draw graphs to illustrate three special cases of PED	☐
• calculate:	
– arc elasticity using percentage changes and the general formula	☐
– arc elasticity using the *original* method	☐
– arc elasticity using the *average* or *mid-point* method	☐
– point elasticity using price, quantity and gradient at a point	☐
• explain the intended effect of advertising on the demand curve	☐
• explain how PED varies along a straight-line demand curve.	☐

1.5 Questions

Question

The price of Good X increases by 5% and the quantity demanded decreases by 10%. Which of the following statements is FALSE?

A   The price elasticity of demand for Good X is – 2.
B   Demand for Good X is relatively elastic.
C   Good X has a downward-sloping demand curve.
D   Good X is likely to have very few substitutes.

Solution

Option D.

The PED of Good X can be calculated as $P\varepsilon_D = \dfrac{\%\,\Delta \text{ in quantity demanded of Good X}}{\%\,\Delta \text{ in price of Good X}} = \dfrac{-10\%}{5\%} = -2$

Therefore, Option A is true.

The absolute value of the PED is greater than 1, so demand for Good X is elastic, and so Option B is true.

The PED is negative, indicating that Good X has a downward sloping demand curve. Therefore Option C is true.

Demand for Good X is elastic. In other words, as the price of Good X rises, there is a more than proportionate decrease in demand. This is likely to be partly because consumers are purchasing cheaper substitutes for Good X. Therefore Option D is likely to be false, and is the correct answer.

Question

The monthly premium for pet insurance increases from $10 to $12 and the number of policies sold reduces from 800 to 700. Calculate the price elasticity of demand (PED) between these two points (*ie* arc elasticity) using:

(i)   the original method

(ii)   the average method.

Solution

(i)   Using the original method, the PED can be calculated as:

$$P\varepsilon_D = \frac{\Delta Q/\text{original } Q}{\Delta P/\text{original } P} = \frac{-100/800}{+2/10} = \frac{-0.125}{+0.2} = -0.625$$

(ii)   Using the average method, the PED can be calculated as:

$$P\varepsilon_D = \frac{\Delta Q/\text{average } Q}{\Delta P/\text{average } P} = \frac{-100/750}{+2/11} = \frac{-0.1333}{+0.1818} = -0.7333$$

Question

Consider the demand equation:

$$QD = \frac{1,000,000}{P}.$$

(i)   Calculate the quantity demanded at a price of 500.

(ii)   Calculate $\frac{dQD}{dP}$ at a price of 500.

(iii)   Show that the price elasticity of demand at a price of 500 (*ie* point elasticity) is equal to -1.

Solution

(i)   *Quantity demanded at a price of 500*

If $P = 500$, the quantity demanded is:

$$QD = \frac{1,000,000}{P} = \frac{1,000,000}{500} = 2,000$$

(ii)   *The rate of change of QD at a price of 500*

$$\frac{dQD}{dP} = \frac{-1,000,000}{P^2}$$

Therefore, at a price of 500:

$$\frac{dQD}{dP} = \frac{-1,000,000}{500^2} = -4$$

(iii)   *Show that the price elasticity of demand is equal to –1*

$$P\varepsilon_D = \frac{dQD}{dP} \times \frac{P}{Q}$$

$$= -4 \times \frac{500}{2,000}$$

$$= -1$$

Question

The demand curve for car insurance is $QD = 1,000,000 - 250P$.

(i)   Calculate the PED (point elasticity) at a price of 500.

(ii)   Calculate the PED (arc elasticity) when price rises from 500 to 505 using both the original and average methods.

(iii) Without doing any further calculations, predict whether revenue would increase or decrease if the price of insurance was increased from 500 to 505.

(iv)   Check your answer to (iii) by calculating the revenue at both price levels.

Solution

(i)   *PED (point elasticity) at a price of 500*

Using the demand curve $QD = 1,000,000 - 250P$, when $P = 500, QD = 875,000$

$$\frac{dQD}{dP} = -250$$

$$P\varepsilon_D = \frac{dQD}{dP} \times \frac{P}{Q}$$

$$= -250 \times \frac{500}{875,000} = -0.1429$$

(ii)   *PED (arc elasticity) when price rises from 500 to 505*

Using the demand curve $QD = 1,000,000 - 250P$:

- when $P = 500, QD = 875,000$

- when $P = 505, QD = 873,750$.

So:

- $\Delta P = +5$

- $\Delta Q = -1,250$

And so using the original method:

$$P\varepsilon_D = \frac{\% \, \Delta \text{ in quantity demanded}}{\% \, \Delta \text{ in price}}$$

$$= \frac{-1250/875,000}{+5/500}$$

$$= -\frac{1}{7} = -0.1429$$

Arc elasticity calculated using the original method gives the same figure for PED as point elasticity in this instance because the demand curve is linear.

Alternatively, using the average method:

$$P\varepsilon_D = \frac{-1250/874,375}{+5/502.5}$$

$$= -0.1437$$

(iii)   *Elasticity and total revenue*

As demand is *inelastic* (*ie* between 0 and –1), we expect total revenue to *increase* in response to an increase in price.

(iv)   *Total revenue calculations*

When $P = 500$, total revenue is given by:

$$TR = P \times Q = 500 \times 875,000 = 437.50 \text{ million}$$

When $P = 505$, total revenue is given by:

$$TR = P \times Q = 505 \times 873,750 = 441.24 \text{ million}$$

ie total revenue has increased (by 3.74 million).

Question

Along a straight-line demand curve which of the following is FALSE?

A   Demand is perfectly elastic where the quantity demanded is zero.
B   Demand is unit elastic at the midpoint of the curve.
C   Elasticity increases as the price falls and the quantity demanded rises.
D   Elasticity decreases as the price falls and the quantity demanded rises.

Solution

Option C.

The following diagram shows how price elasticity varies along a straight-line demand curve:
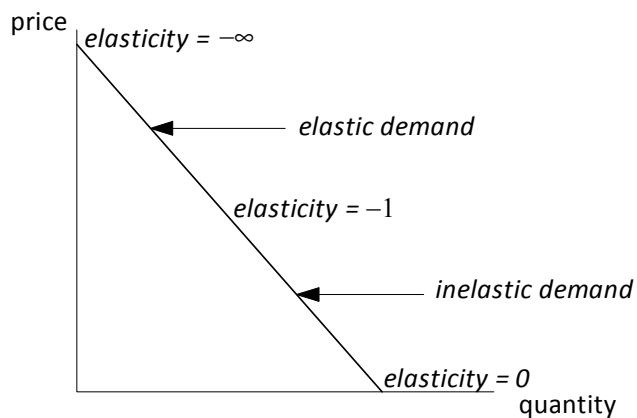
When quantity demanded equals zero, price elasticity of demand is (minus) infinity, *ie* it is perfectly elastic – Option A.

Midway along the curve, demand is unit elastic – Option B.

Elasticity *decreases* as the price falls and the quantity demanded rises – Option D.

Note that since Options C and D are opposites, the correct answer has to be one of these.

2   Other elasticities

2.1   What's included in this section

- Price elasticity of supply (PES)

- Income elasticity of demand (IED)

- Cross-price elasticity of demand (CPED)

2.2   Guidance

It is important to be able to calculate these measures of elasticity and draw appropriate conclusions from the results.

2.3   Reading

Task	√*when completed*
Read Chapter 2, pages 65–69.	☐

2.4   Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– price elasticity of supply (PES)	☐
– income elasticity of demand (IED)	☐
– cross-price elasticity of demand (CPED)	☐
– normal goods	☐
– inferior goods	☐
• state the factors that influence the values of PES, IED and CPED	☐
• calculate (using the general formulae, arc and point methods) PES, IED and CPED and interpret the results of these calculations.	☐

2.5   Questions

Question

The price of Good Y increases by 8% and the demand for Good X increases by 10%, calculate the cross-price elasticity of demand (CPED) of Good X with respect to Good Y, and comment on the relationship between the two goods.

Solution

CPED can be calculated as follows:

$$C\varepsilon_{D_{XY}} = \frac{\% \, \Delta \text{ in quantity demanded of Good X}}{\% \, \Delta \text{ in price of Good Y}}$$

$$C\varepsilon_{D_{XY}} = \frac{+10\%}{+8\%} = +1.25$$

Good X and Good Y are likely to be quite close substitutes, as an increase in the price of Good Y has led to a more than proportionate increase in the demand for Good X.

Question

When Peter's income increases by 10%, his demand for Good A increases by 2%, his demand for Good B increases by 15% and his demand for Good C decreases by 5%.

Calculate and comment on Peter's income elasticity of demand for the three goods.

Solution

Income elasticity of demand (IED) can be calculated as follows:

$$Y\varepsilon_D = \frac{\% \, \Delta \text{ in quantity demanded of Good X}}{\% \, \Delta \text{ in income}}$$

Peter's income elasticity of demand for Good A is:

$$\frac{+2\%}{+10\%} = +0.2$$

Good A is a *normal good*, since the IED is positive.

Peter's income elasticity of demand for Good B is:

$$\frac{+15\%}{+10\%} = +1.5$$

Good B is also a *normal good*, since the IED is positive. In addition, since IED$_B$ > IED$_A$, Good B is more of a luxury than Good A.

Peter's income elasticity of demand for Good C is:

$$\frac{-5\%}{+10\%} = -0.5$$

Good C is an *inferior good*, since the IED is negative.

Question

Which of the following statements is TRUE?

A   Cross-price elasticity of demand is positive for complementary goods.
B   Elasticity of supply is zero along a horizontal supply curve.
C   Price elasticity of demand varies along a straight-line demand curve.
D   Income elasticity of demand is positive for inferior goods.

Solution

Option C.
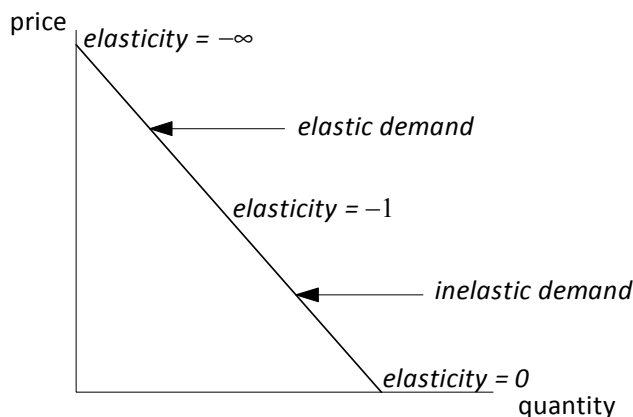
The price elasticity of demand varies along a straight-line demand curve as shown above.

Although the absolute change in quantity demanded in response to a given absolute change in price is the same at all points along a straight-line demand curve, the demand is more elastic at higher prices because it is expressed in *percentage* terms. For example, the higher the price and the lower the quantity demanded, the lower the *percentage* change in price and the higher the *percentage* change in quantity demanded. Hence, the higher is the elasticity. Conversely, the lower the price and the higher the quantity demanded, the higher the percentage change in price and the lower the percentage change in quantity demanded, giving a lower elasticity. Therefore Option C is TRUE.

The *cross-price elasticity of demand* will generally be *negative* for complementary goods that are used together, such as cars and petrol. This is because an increase in the price of cars say will lead to a decrease in the number of cars purchased and a corresponding decrease in the use of petrol. Therefore Option A is FALSE.

Elasticity of supply is *infinite* along a horizontal supply curve, as an infinitesimal fall in price will (in theory at least) lead to an infinite decrease in the quantity supplied. An elasticity of zero instead corresponds to a vertical supply curve. (Remember that in general flatter/steeper curves tend to be more/less elastic). Therefore Option B is FALSE.

An *inferior good* is defined as a good for which the income elasticity of demand is negative, *ie* for which demand goes down as income goes up. Therefore Option D is FALSE.

3 The time dimension

3.1 What's included in this section

- Short-run and long-run adjustment (the impact of markets taking time to adjust fully to changes in supply and demand)

- Price expectations and speculation

- Dealing with uncertainty and risk

3.2 Guidance

There are two useful boxes in this section:

- Box 2.7 explains the practice of short selling. It is important to be clear about the process, *ie* who does what, and the potential advantages and disadvantages.

- Box 2.8 covers forwards and futures, which are essentially agreements between two parties to trade a specified asset at a specified price on a specified date in the future. The detailed information in the box illustrates how they can be used to reduce uncertainty.

3.3 Reading

Task	√*when completed*
Read Chapter 2, pages 70–76.	☐

3.4 Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– speculation	☐
– speculators	☐
– self-fulfilling speculation	☐
– stabilising / destabilising speculation	☐
– risk	☐
– uncertainty	☐
– futures or forward market	☐
– short selling (or shorting)	☐
– future price	☐
– spot price.	☐

Task	√when completed
Continued	
Ensure that you can:	
• explain and illustrate how markets adjust over time to changes in demand and supply	☐
• distinguish between, and draw diagrams to illustrate, stabilising and destabilising speculation	☐
• distinguish between risk and uncertainty	☐
• outline the advantages and disadvantages of short selling	☐
• explain how the following can help firms to deal with uncertainty:	
– holding stocks	☐
– forwards or futures	☐
• explain how futures and forwards can be used by:	
– firms and individuals to reduce uncertainty	☐
– speculators to try to make profits.	☐

3.5 Questions

Question

Poor crop yields lead to a shortage of wheat and hence a rise in the price.

Outline the impact that speculation by consumers and suppliers will have on the wheat price if they believe that the price rises seen so far are a sign of further rises to come.

Solution

Consumers wish to buy now, whilst the price of wheat is relatively cheap. This will lead to an increase in demand for wheat, *ie* the demand curve will shift to the right.

Suppliers will wish to hold back or defer supply, so that they can sell their wheat once the price has risen. This will lead to a decrease in the supply of wheat, *ie* the supply curve will shift to the left.

Both these speculative actions will lead to further rises in the price of wheat, *ie* this is an example of self-fulfilling speculation that has a *destabilising* effect on the price.

Question

Suppose the six-month future price of oil is $100 a barrel, but an investor expects the spot price to be *more than* $100 in six months' time. She attempts to take advantage of this by buying 20 oil futures, each based on 1,000 barrels of oil.

Calculate the investor's profit / loss if in six months' time the spot price is:

(i) $110 a barrel

(ii) $80 a barrel

Solution

(i)   If the spot price in six months' time is $110 a barrel, then she will make a profit of $10,000 on each oil future, *ie* a profit of $200,000 in total.

(ii)   If the spot price is $80 a barrel, then she will make a loss of $20,000 on each oil future, *ie* a loss of $400,000 in total.

Question

Which of the following statements is FALSE?

A   Uncertainty is a measure of the variability of an outcome.

B   Risk is when the outcome of an action may or may not occur, but the probability of it occurring is known.

C   Uncertainty is when an outcome may or may not occur and its probability of occurring is unknown.

D   A short seller is exposed to the risk that the asset they have short sold will rise in price, leading them to make a loss.

Solution

Option A. *Uncertainty* occurs when the probability of an outcome is *not* known. Therefore uncertainty cannot be a measure of the variability of an outcome, so Option A is false and is the correct answer. *Risk* is a measure of the variability of an outcome.

4   The control of prices

4.1   What's included in this section

- Setting a minimum (high) price (or 'floor')

- Setting a maximum (low) price (or 'ceiling')

4.2   Guidance

Exam questions often ask for the effects of a maximum or minimum price when it is set above or below the equilibrium price. Drawing a diagram helps, even if the question doesn't ask for one.

Boxes 3.1 – 3.3 cover issues which have been topical in the UK in recent years. The broad issues described in these boxes may form a good basis for Subject CB2 exam questions.

4.3   Reading

Task	√when completed
Read Chapter 3, pages 80–88.	☐

4.4   Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– minimum price (or 'floor')	☐
– maximum price (or 'ceiling')	☐
– rationing	☐
– illegal or underground or shadow markets	☐
• draw diagrams to show the effect of price controls on quantity demanded and quantity supplied	☐
• explain and illustrate how elasticity of supply/demand will affect the size of any surplus or shortage arising as a result of price controls	☐
• outline the possible reasons for imposing a minimum price	☐
• discuss the effects of imposing a minimum price and the ways that government may address these effects	☐
• outline the possible reasons for imposing a maximum price	☐
• discuss the effects of imposing a maximum price and the ways that government may address these effects.	☐

4.5   Questions

Question

A maximum price (ceiling) set below the free market price results in:

A   excess demand and shortages.
B   excess supply and surpluses.
C   excess demand and surpluses.
D   excess supply and shortages.

Solution

Option A. In the diagram, we can see that a maximum price set below the equilibrium price results in excess demand and hence a shortage equal to $Q_d - Q_s$.
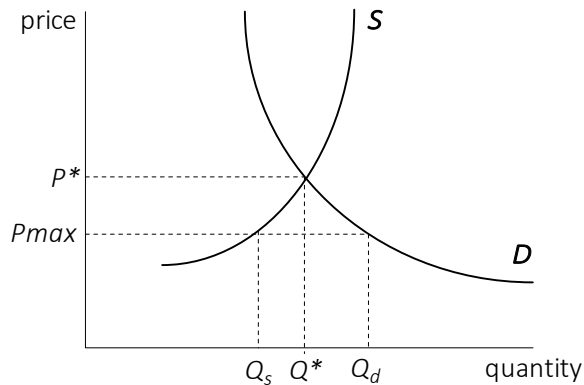
Question

A maximum price for widgets set above the free market price will lead to:

A   a surplus of widgets.
B   a shortage of widgets.
C   no effect.
D   a fall in the supply of widgets.

Solution

Option C. A maximum price has no effect on the market if it is above the equilibrium price.

Question

Discuss the advantages and disadvantages of price floors (minimum guaranteed prices) for agricultural produce.

Your discussion should include appropriate diagrams.

Solution

Governments often introduce minimum prices for agricultural produce in order to protect farmers' incomes. If left to the free market, prices could be very volatile as supply is subject to changeable and unpredictable growing / rearing conditions.

Assuming that the price floor is set above the free market equilibrium price, it will have the effect shown in the diagram below:
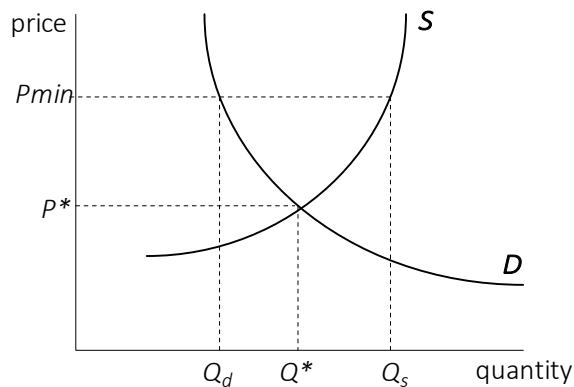
With a price floor of $Pmin$, suppliers want to supply quantity Q_s, but consumers will only demand quantity Q_d. So the quantity traded will be Q_d. There is a surplus of ($Q_s - Q_d$). If the government wants to maintain the price floor, it will need to deal with the surplus (see disadvantages below).

Advantages

• The guaranteed price provides farmers with a secure level of income regardless of fluctuations in the free-market price of their produce.

• Without this support, farmers would suffer from volatile incomes and might leave the industry for occupations with a more predictable income.

• The public might not wish to see the decline of the agricultural sector in a country for fear of being dependent on foreign countries for food and/or because of the consequences for the state of the countryside.

• A surplus could be stored in preparation for possible future shortages.

Disadvantages

- The government has to deal with the surplus. It could:

    - buy up the surplus and store it (which is expensive but helpful if a surplus one year is followed by a shortage the next)

    - destroy it (which is wasteful) or sell it on the world market (at lower prices than that guaranteed to producers)

    - reduce it by giving producers fixed-production quotas

    - reduce it by encouraging consumers to buy more, *eg* by advertising

    - reduce it by finding alternative uses for the product and hence increasing demand for it.

- If the government does not buy up the extra supply, some suppliers may be tempted to break the minimum price rule and offer goods for sale at less than the official minimum.

- The support given to farmers might reduce efforts to improve efficiency.

- High prices for a particular product might discourage producers from producing alternative goods that they could produce more efficiently or which are in higher demand.

- Total consumption is lower than under the free market equilibrium, resulting in a loss of utility to consumers.

5   Indirect taxes and subsidies

5.1   What's included in this section

- The effect of imposing taxes on goods

- Elasticity and the incidence of taxation

- The effect of subsidising products

5.2   Guidance

It is important to be able to:

- explain the impact of indirect taxes and subsidies on equilibrium quantity and price

- draw diagrams to Illustrate the effects of indirect taxes and subsidies.

5.3   Reading

Task	√when completed
Read Chapter 3, pages 88–93.	☐

5.4   Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– indirect tax	☐
– specific tax	☐
– *ad valorem* tax	☐
– incidence of tax	☐
– consumers' share of a tax on a good	☐
– producers' share of a tax on a good	☐
• explain, with the aid of diagrams, the impact of specific and *ad valorem* taxes / subsidies on the supply curve and the equilibrium quantity and price	☐
• draw diagrams to illustrate how the burden (benefit) of indirect taxes (subsidies) is shared between consumers and producers	☐
• explain and illustrate how price elasticities of demand and supply affect tax incidence and tax revenue.	☐

5.5   Questions

Question

The market demand and supply functions for Good X are as follows:

$$Q_d = 1400 - P$$

$$Q_s = 200 + P$$

(i)   Calculate the current equilibrium market price and quantity of Good X.

Suppose that the government introduces a subsidy of 100 on Good X.

(ii)   Calculate the revised equilibrium market price and quantity.

Solution

(i)   *Current equilibrium market price and quantity of Good X*

Equating the demand and supply functions gives:

$$1400 - P = 200 + P$$

which solves to give the equilibrium price and quantity:

$$P = 600 \text{ and } Q = 800$$

(ii)   *Revised equilibrium market price and quantity*

Whereas producers previously based their supply decisions on the market price, they will now base their decisions on the market price plus the 100 subsidy, as this is the total income they will now receive for selling goods at the (revised) market price.

The revised supply function is therefore:

$$Q_s = 200 + (P' + 100)$$

where P' is the revised market price. Equating this with the unchanged demand function gives:

$$1400 - P' = 200 + (P' + 100)$$

which solves to give:

$$P' = 550 \text{ and } Q' = 1400 - P' = 850$$

Module 4 Practice Questions

4.1   The quantity demanded of Good X falls from 500 units per week to 400 units per week when the price rises from £20 to £21.

Calculate the price elasticity of demand for Good X between these two points, *ie* the arc elasticity.   [1]

4.2   What is the intended effect of an advertising campaign on the demand curve:

Exam style

A   Shift the curve to the left and make it more elastic.
B   Shift the curve to the right and make it more elastic.
C   Shift the curve to the left and make it more inelastic.
D   Shift the curve to the right and make it more inelastic.   [1½]

4.3   This question is based on the following three supply curves, where P is price and Q is the quantity supplied.

Exam style

I $P = 2Q$
II $P = Q$
III $P = 0.5Q$

Which of the following statements is TRUE?

A   All three curves have a supply elasticity of 1 at all levels of output.
B   Only II has a supply elasticity of 1 at all levels of output.
C   None of them ever has a supply elasticity of 1.
D   All three have a supply elasticity of 1 at only one output level.   [1½]

4.4   If the income elasticity of demand for Good X is 1.5, a 4% increase in consumer income will increase the quantity demanded of Good X by:

Exam style

A   2.50%
B   2.67%
C   5.50%
D   6.00%   [1½]

4.5   The total revenue from the sale of a good will fall if:

Exam style

A   price rises and demand for the good is price-elastic.
B   price rises and demand for the good is price-inelastic.
C   consumer income falls and the good is inferior.
D   consumer income rises and the good is a normal good.   [1½]

4.6   Good Y has a cross-price elasticity of demand with respect to Good X of 0.5. 100 units of Good Y
       are demanded when Good X costs $50. Using the 'original' formula for cross-price elasticity of
       demand between two points (*ie* arc elasticity), a rise in the price of Good X to $75 will lead to a
       change in the demand for Good Y to:

Exam style

       A   150 units.
       B   125 units.
       C   75 units.
       D   50 units.   [1½]

4.7   The income elasticity of demand for a normal good:

Exam style   A   must be less than 1.
       B   must be greater than 1.
       C   must be positive.
       D   could be anything.   [1½]

4.8   Describe three factors that will make the demand curve for a good more price-elastic, other
       things being equal.   [3]

Exam style

4.9   Shadow markets are most likely to be associated with:

Exam style   A   price ceilings which cause excess demand.
       B   price ceilings which cause excess supply.
       C   price floors which cause excess demand.
       D   price floors which cause excess supply.   [1½]

4.10   A price floor set above the market equilibrium price is likely to cause:

Exam style   A   excess supply.
       B   excess demand.
       C   a decrease in price and a decrease in the quantity traded.
       D   an increase in price and an increase in the quantity traded.   [1½]

4.11   Discuss the advantages and disadvantages of price ceilings.

Exam style

       Your discussion should include examples and be illustrated with appropriate diagrams.   [10]

4.12   If the demand for Good X is price-inelastic and the supply of Good X is price-elastic, then the
       burden of a sales tax on Good X will be borne:

Exam style

       A   equally by buyers and sellers.
       B   more heavily by buyers.
       C   more heavily by sellers.
       D   by neither buyers nor sellers.   [1½]

ABC **Module 4 Solutions**

4.1   Using the 'original' method, the price elasticity of demand can be calculated as follows:

$$P\varepsilon_D = \frac{\% \Delta \text{ in quantity demanded of Good X}}{\% \Delta \text{ in price of Good X}}$$

$$= \frac{-100/500}{+1/20} = \frac{-20\%}{+5\%}$$

$$= -4$$

Alternatively, using the 'average' method:

$$P\varepsilon_D = \frac{-100/450}{+1/20.5} = \frac{-22.2\dot{2}\%}{+4.88\%}$$

$$= -4.55$$

4.2   Option D. Advertising campaigns generally intend to increase both demand and brand loyalty for a product. A shift of the curve to the right corresponds to an increase in demand. If the curve becomes more inelastic *ie* steeper, consumers are becoming less price sensitive, in this scenario probably because of an increase in brand loyalty.   [1½]

4.3   Option A.

Any straight-line supply curve passing through the origin has a supply elasticity of 1 at all points. For example, let:

     P = *cQ*   (where *P* is price, *Q* is quantity supplied and *c* is a constant).

Then the elasticity of supply is:

$$P\varepsilon_S = \frac{P}{Q} \times \frac{dQ}{dP}$$

$$= \frac{P}{Q} \times \frac{1}{c}$$

$$= \frac{cQ}{Q} \times \frac{1}{c} = 1$$

Thus, I, II and III all have a supply elasticity of 1 at all levels.   [1½]

4.4   Option D. Income elasticity of demand measures the percentage change in quantity demanded as a proportion of the percentage change in income. The percentage increase in demand for Good X will therefore be $1.5 \times 4\% = 6\%$.   [1½]

4.5   *This question is Subject CT7, April 2010, Question 21.*

        Option A.

        Demand for a good is said to be 'elastic' when the absolute value of the price elasticity of demand is greater than one. Option A is therefore correct because the (larger) percentage fall in quantity will have a greater effect on revenue than the increase in price.

        Option C is wrong because when consumer income falls, the demand curve for an inferior good shifts to the right. This increases both price and quantity and hence revenue. Option D is wrong by a similar argument, as the demand for a normal good will shift to the right if consumer income rises.   [1½]

4.6   *This question is Subject CT7, April 2012, Question 3.*

        Option B.

        We are given:

        $$\frac{\text{\% change in quantity demanded of Y}}{\text{\% change in price of X}} = 0.5$$

        The price of Good X rises from \$50 to \$75, a 50% increase. Substituting in our equation gives:

        $$\frac{\text{\% change in quantity demanded of Y}}{50\%} = 0.5$$

        We therefore have a 25% increase in the quantity of Good Y demanded, taking the demand from 100 units to 125 units.   [1½]

4.7   Option C. By definition, the income elasticity for a normal good is *positive*, but it could be either greater or less than +1.   [1½]

4.8   Three factors that will make the demand curve for a good more price-elastic, other things being equal, are:

        1.   An *increase in the number and closeness of substitute goods*. This will make it is easier to find a substitute if the price of the original good increases.   [1]

        2.   a *longer time period*. The longer the time period considered, the more elastic will be demand, given that it is easier to find and make use of a substitute in the long run than in the short run.   [1]

        3.   a *higher proportion of consumers' incomes being spent on the good*. The effect of a price increase on consumers' real incomes will then be greater giving them more incentive to swap to other cheaper goods.   [1]

                                                                                                        [Total 3]

4.9   Option A. Shadow markets tend to develop when there is a shortage. A shortage occurs when the quantity demanded exceeds the quantity supplied. This occurs if the price is below the equilibrium price and is not allowed to increase to the equilibrium price, *ie* if the government has set a ceiling (or maximum price) below the equilibrium.   [1½]

4.10   *This question is Subject CT7, April 2006, Question 4.*

Option A. A price floor sets a minimum price for the product, so if this is set above the equilibrium price, the price has to *increase* from the equilibrium price to the minimum price. At this price, the quantity supplied will exceed the quantity demanded so there will be a surplus. [1½]

4.11   A price ceiling operates when the government passes a law making it illegal to charge more than a certain amount for a good.   [1]
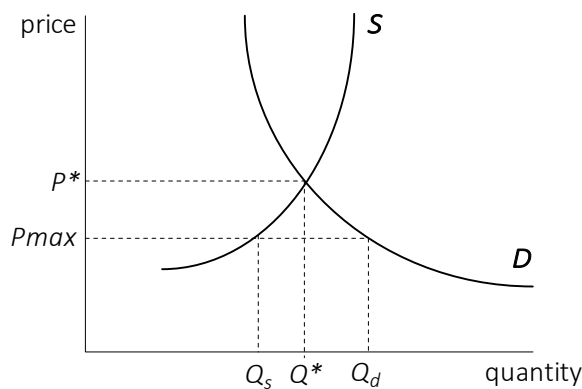
[1]

The diagram shows the situation in which a price ceiling is set a price level below the free market equilibrium price.

With a price ceiling of *Pmax* , suppliers will want to supply quantity Q_s , whereas consumers will demand quantity Q_d . The quantity traded will be Q_s . With only this amount available, a shortage of $(Q_d - Q_s)$ will develop. A price ceiling set below the free market price therefore produces excess demand and shortages.   [1]

Advantages

*   The lower price means that some people will be able to afford the good who could not do so under the free market equilibrium.   [1]

*   Such ceilings are common in wartime when essentials such as food and clothing would otherwise by very expensive and unaffordable for the poor.   [1]

Disadvantages

- The available supply needs to be rationed. This could be by:

  – queueing / waiting lists   [½]

  – random ballots   [½]

  – firms adopting their own priorities, *eg* regular customers   [½]

  – a formal system of rationing organised by the government, *eg* ration books and coupons (which is fairer than other methods but also more expensive to operate).   [½]

- Some suppliers may be tempted to offer goods for sale illegally at a price above the price ceiling, *ie* a shadow market may develop …   [1]

  … this may encourage criminality …   [½]

  … additionally, there will be costs of enforcement involved in trying to prevent this activity.   [½]

- Total consumption will be lower than under the free market equilibrium – with a consequent loss of utility to consumers.   [1]

- The low prices deter suppliers and encourage them to produce something else instead, thus reducing supplies further in the future.   [1]

                                                                                                 [Maximum 10]

4.12   Option B.

At any given market price, suppliers will be willing to supply less, and so the supply curve will shift vertically upward by the amount of the tax. If demand is inelastic (steep demand curve) and supply elastic (flat supply curve), then price will rise substantially with little effect on quantity supplied and demanded. Thus, buyers will bear most of the brunt of the new tax. This is because their demand is relatively insensitive to the price of Good X, perhaps because it has few close substitutes.   [1½]

On the diagram below, the (market) price paid by consumers increases from P_1 to P_2, whilst the (net of tax) price received by suppliers falls from P_1 to P_S – the difference between P_2 and P_S representing the amount of the tax.

5
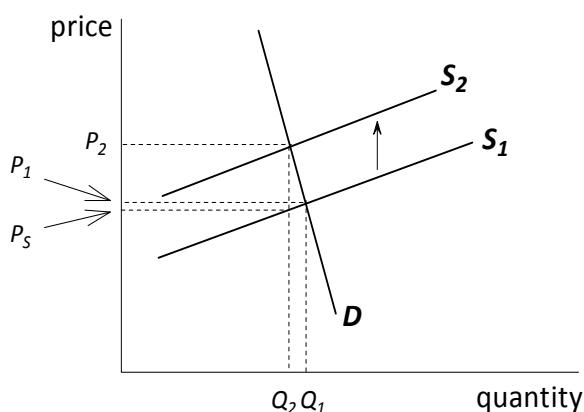
Background to demand

Syllabus objectives

2.2   Discuss consumer demand and behaviour.

1.   Describe the concept of utility and representation of consumer preferences as indifference curves.

2.   Discuss rational choice and how optimal consumption choice is determined by using indifference curves and budget lines.

3.   Discuss the concepts of rational choice, perfect information and irrational behaviour in behavioural economics.

Core Reading

0   Introduction

In this module, we look at demand in more detail. Our aim is to understand how consumers make choices about what to buy.

Firstly, we assume that consumers are rational and examine two theories of demand that were developed by neoclassical economists in the 19th and early 20th centuries:

1.   the marginal utility theory (Section 1)

2.   indifference curve analysis (Section 3).

These two theories also offer explanations for the downward-sloping shape of the demand curve.

Section 2 considers the impact of the timing of costs and benefits on utility and hence its impact on the rational choice model.

In Section 4, we move on to consider how rational consumers make choices in times of risk and uncertainty, and think about the role of insurance in reducing risk.

In the final section, we study behavioural economics. This departs from the assumption of rational behaviour because it acknowledges that many real-world decisions do not appear to be rational. It therefore seeks to understand and explain human behaviour, which is complex and has many influences.

Most of the material in this module is new to Subject CB2.

1   Marginal utility theory

1.1   What's included in this section

- Total and marginal utility
- The one-commodity model:
  – Optimum consumption
  – Marginal utility and the demand curve
  – Weaknesses of the model
- The multi-commodity model:
  – Optimum combination of goods consumed
  – Marginal utility and the demand curve

1.2   Guidance

As a guide to the reading, the following might be of help:

- This work was developed by neoclassical economists in the late 19th century. In the one-commodity model, an individual's demand curve is based on that person's marginal utility curve. This simple model has weaknesses, so the multi-commodity model, which starts under the subheading 'The optimum combination of goods consumed', addresses these concerns.

- The condition for the *equi-marginal principle* (in consumption) can be applied strictly only where the goods involved are divisible and we are able to evaluate the marginal utilities of fractions of goods. This is not normally the case in practice and so a question on this topic might have to be solved by trial and error.

- Box 4.2 describes the water-diamond paradox and offers a solution to it. This well-known paradox, which has been examined in the past, is not discussed in the body of the text.

- The material on the multi-commodity model is new to CB2, though it was in the pre-2010 CT7 syllabus and therefore there are past exam questions to study.

1.3   Reading

Task	√when completed
Read Chapter 4, pages 104–112.	☐

1.4 Checklist

Task	√ *when completed*
Ensure that you can:	
• define the following key terms:	
– rational consumer	☐
– total utility	☐
– marginal utility	☐
– util	☐
– principle of diminishing marginal utility	☐
– consumer surplus	☐
– marginal consumer surplus	☐
– total consumer surplus	☐
– rational consumer behaviour	☐
– equi-marginal principle (in consumption)	☐
• explain and illustrate the relationship between total utility and marginal utility curves	☐
• give a reason why a person's marginal utility schedule might change	☐
• describe and clarify the water-diamond paradox	☐
• explain the derivation of the demand curve according to the one-commodity model	☐
• discuss the weaknesses of the one-commodity model	☐
• explain why the optimum combination of goods consumed occurs where the marginal utility per £ spent is equal for all goods	☐
• explain the derivation of the demand curve according to the multi-commodity model.	☐

1.5   Questions

Question

(i)   Use the figures in the following table to calculate the marginal utility (expressed in $s) Sanjay obtains by consuming Good X and comment on your answers.

Consumption of Good X	Total utility ($)
1	30
2	55
3	76
4	95
5	113

(ii)   Suppose that the market price of Good X is $20. Determine the number of units of Good X Sanjay should consume and calculate his resulting consumer surplus.

Solution

(i)   The marginal utility column can be seen in the following table:

Consumption of Good X	Total utility ($)	Marginal utility ($)
1	30	30
2	55	25
3	76	21
4	95	19
5	113	18

The marginal utility decreases with each additional unit consumed. This is in accordance with the *principle of diminishing marginal utility*.

(ii)   If Sanjay is rational, he should purchase additional units of Good X so long as the marginal utility obtained exceeds or equals the market price of the good. He should therefore purchase and consume three units of Good X.

The consumer surplus is equal to the excess utility of the units consumed over and above the amount paid for them. Here it is equal to:

$$(30 - 20) + (25 - 20) + (21 - 20) = \$16$$

or equivalently, $76 - (3 \times 20) = \$16$.

Question

Nineteenth-century economists were puzzled as to why water, which is essential to life, is so much cheaper than diamonds, which are not essential.

Explain this paradox.

Solution

The total utility derived from water is very high but, for most of us, the *marginal utility* of water is very low. We can consume nearly as much water as we want, so the extra utility derived by the extra glass of water is very low.

In contrast, the total utility derived from diamonds is much lower than that derived from water because we consume so few of them. However, the much lower consumption of diamonds means that the *marginal* utility of diamonds is much higher than the *marginal* utility of water.

It is *marginal* utility, not *total* utility, that determines the price. The higher marginal utility of diamonds is then associated with the higher price of diamonds. Note that if we were in a desert, the marginal utility of a glass of water would be huge − and no doubt, we would be prepared to pay a very high price for it.

Furthermore, demand is only half the story. Price is also determined by supply. Very few diamonds are produced, so even though the demand for diamonds is lower than the demand for water, the price of diamonds could still be higher. Note that the supply of water in a desert is very low too and so the price of water would be much higher than normal there.

The supply and demand for water and diamonds is illustrated in the following diagram.
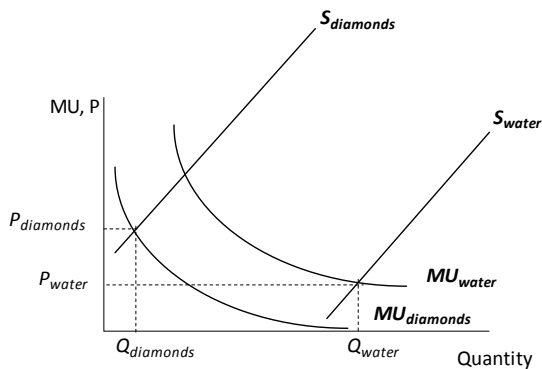
Question

The following table shows the total utility that Peter receives from consuming various quantities of Good X and Good Y.

Units of good consumed	Total utility from units of Good X consumed	Marginal utility from each unit of Good X consumed	Total utility from units of Good Y consumed	Marginal utility from each unit of Good Y consumed
1	10		12	
2	18		22	
3	25		30	
4	30		36	
5	34		40	
6	37		43	

(i)   Complete the columns for the marginal utility of Good X and the marginal utility of Good Y.

(ii)   If Good X costs £2 and Good Y costs £4, list the possible combinations of goods that would satisfy the condition for the optimum combination of goods consumed and calculate the total utility of each combination.

(iii) Assuming that Peter has £16 to spend on the two goods (and that there are no other goods available), identify the combination of Good X and Good Y that he will consume.

(iv)   If Peter's income now increases to £20, determine the combination of goods he will now buy.

Solution

(i)   The marginal utilities for additional units of Good X are: 10, 8, 7, 5, 4, 3.

       The marginal utilities for additional units of Good Y are: 12, 10, 8, 6, 4, 3.

(ii)   The *equi-marginal principle* states that utility will be maximised if the ratio of the marginal utilities is equal to the ratio of the prices (or alternatively that the marginal utilities per £ spent are equal). Algebraically:

$$\frac{MU_X}{MU_Y} = \frac{P_X}{P_Y} \quad \text{or} \quad \frac{MU_X}{P_X} = \frac{MU_Y}{P_Y}$$

       In this case, given that Good Y costs twice as much as Good X, the marginal utility of Good Y must be twice that of Good X.

The equilibrium condition will be satisfied at the following combinations:

$4X + 2Y$ gives total utility of 52

$5X + 3Y$ gives total utility of 64

$6X + 4Y$ gives total utility of 73

(iii) The cost of the first bundle is $(4 \times £2) + (2 \times £4) = £16$, which is affordable, but the cost of the second bundle is $(5 \times £2) + (3 \times £4) = £22$, and the third is $(6 \times £2) + (4 \times £4) = £28$, neither of which Peter cannot afford. Therefore the bundle that maximises utility, given Peter's limited income is $4X + 2Y$.

(iv) If Peter's income increases to £20, he still cannot afford the second bundle listed above. However, he could afford an additional unit of Good Y and thereby increase his total utility to 60, or an extra two units of Good X and hence increase total utility to 59. He will choose to buy $4X + 3Y$ to maximise his utility.

We can see that at this combination:

$$\frac{MU_X}{P_X} = \frac{5}{2} > \frac{8}{4} = \frac{MU_Y}{P_Y}$$

Peter is receiving higher marginal utility per £ spent on Good X than on Good Y. Therefore to increase total utility, with his limited income, ideally, he would like to buy a bit more of Good X and/or a bit less of Good Y. Since we assume goods can only be bought in whole units, he is unable to do this.

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2   The timing of costs and benefits

</div>

2.1   What's included in this section

- Optimum consumption with intertemporal choice

- Discounting: measuring impatience

2.2   Guidance

The benefits derived from the consumption of some goods, *eg* consumer durables, such as cars and fridges, and the costs derived from the consumption of other goods, *eg* cigarettes and alcohol, occur over a period of time. So, for these goods, consumers have to compare the value of future benefits with current costs or current benefits with future costs in order to make rational intertemporal choices. They do this by discounting future costs and benefits to present values.

This material is new to Subject CB2.

2.3   Reading

Task	√*when completed*
Read Chapter 4, pages 113–114.	☐

2.4   Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– exponential discounting	☐
– present value (in consumption)	☐
– discount factor	☐
• explain how a rational consumer can make optimal choices when the costs and benefits of consumption occur over a period of time.	☐

2.5   Questions

Question

A consumer is considering buying a new car. It will cost £10,000 at the outset, it will last for 10 years, it will cost £500 per year to run and will yield £1,600 of utility each year of its life. Should the consumer buy the car?

A   Yes, because the car costs £10,000 but will yield £11,000 of benefits over its life.
B   Yes, because the present value of the car's benefits exceeds the present value of its costs.
C   No, because the car costs £10,000 now and the benefits are received later.
D   We haven't been given sufficient information to make this decision.

Solution

Option D.

We need to calculate the present value of the costs and benefits. To do this we need to know the discount factor, *ie* the factor that we need to multiply a cost or benefit in the future by to adjust it to what it would be worth to the consumer now.

For example, if the yearly discount factor is 0.9, and if the costs and benefits are assumed to occur at the end of each year (to make the arithmetic easier):

the present value of the costs

$$= £10,000 + 0.9 \times £500 + 0.9^2 \times £500 + \cdots + 0.9^{10} \times £500$$

$$= £10,000 + 0.9 \times £500(1 + 0.9 + \cdots + 0.9^9)$$

$$= £10,000 + 0.9 \times £500 \frac{(1 - 0.9^{10})}{(1 - 0.9)} \text{ using the formula for the sum of a GP}$$

$$= £10,000 + 0.9 \times £500 \times 6.5132$$

$$= £12,930.95$$

the present value of the benefits

$$= 0.9 \times £1,600 + 0.9^2 \times £1,600 + \cdots + 0.9^{10} \times £1,600$$

$$= 0.9 \times £1,600(1 + 0.9 + \cdots + 0.9^9)$$

$$= 0.9 \times £1,600 \times 6.5132$$

$$= £9,379.03$$

So, in this case, the present value of the benefits does not exceed the present value of the costs and the car would not be worth buying.

3   Indifference analysis

3.1   What's included in this section

- The limitations of the marginal utility approach to demand

- Indifference curves

- The budget line

- The optimum consumption point

- The effect of changes in income

- The effect of changes in prices

- Deriving the individual's demand curve

- The income and substitution effects of a price change

- The usefulness of indifference analysis

3.2   Guidance

As a guide to the reading, the following might be of help:

- Some students find this topic very difficult; and others find it quite fun. The topic builds up bit by bit, so it is important to understand each section before moving on to the next.

- Notice that indifference curves can never cross.

- The optimum consumption point is the position that maximises satisfaction (as indicated by being on the highest possible indifference curve) subject to the consumer's limited income and the prices of the goods (as indicated by the consumer's budget line). It therefore occurs where an indifference curve is tangential to the budget line.

- When there is a change in income or prices, the budget line changes. More specifically, a change in income causes the budget line to shift inwards or outwards, whereas a change in prices causes its slope to change.

- It is possible to show a variety of outcomes of such a change by changing the shape of the indifference curves. For example, an increase in income could show an increase in demand for a normal good or a decrease in demand for an inferior good. It is important to work out what we want to show and therefore where we want the equilibrium positions to be before adding indifference curves to the diagram.

- When separating the substitution and income effects of a price change, it is helpful to remember that:

    – the *substitution effect* arises from a *change in relative prices*, which is reflected in the change in the *slope* of the budget line

    – the *income effect* arises from a *change in real income*, which is reflected in the change in the *position* of the budget line.

- This material is new to CB2, though it was in the pre-2010 CT7 syllabus and therefore there are past exam questions to study.

3.3 Reading

Task	√ *when completed*
Read Chapter 4, pages 115–126, excluding Boxes 4.4 and 4.5.	☐

3.4 Checklist

Task	√ *when completed*
Ensure that you can:	

- define the following key terms:
  - indifference curve ☐
  - marginal rate of substitution (between two goods in consumption) ☐
  - diminishing marginal rate of substitution ☐
  - indifference map ☐
  - budget line ☐
  - income-consumption curve ☐
  - real income ☐
  - price-consumption curve ☐
  - income effect of a price change ☐
  - substitution effect of a price change ☐
  - Giffen good ☐
- describe the main benefit of indifference analysis over marginal utility theory ☐
- explain why an indifference curve is convex to the origin ☐
- state the algebraic relationship between the marginal rate of substitution and the marginal utilities of Good X and Good Y ☐
- construct budget lines when given income and prices of two goods ☐
- express the slope of the budget line in terms of the prices of two goods ☐
- illustrate the effect on the budget line of changes in income and prices ☐
- draw a diagram to illustrate the optimum consumption point and explain why this position maximises utility. ☐

Task	√*when completed*
Continued Ensure that you can: • illustrate the effect of a change in real income on the demand for two commodities, one of which might be an inferior good	☐
• illustrate the effect of a change in the price of one commodity on the demand for two commodities	☐
• illustrate and explain the way in which an individual's demand curve may be derived using indifference analysis	☐
• explain, using a diagram, the separation of the income and substitution effects of a price change for a:	
– normal good	☐
– inferior but non-Giffen good	☐
– Giffen good	☐
• discuss the usefulness of indifference analysis.	☐

3.5 Questions

Question

A consumer has the choice of the following four consumption bundles:

     Bundle A   20 units of X and 10 units of Y
     Bundle B   15 units of X and 15 units of Y
     Bundle C   10 units of X and 20 units of Y
     Bundle D   12 units of X and 12 units of Y

Explain, as fully as possible, how a consumer would rank these four bundles if the consumer is indifferent between Bundle A and Bundle C. You should assume that X and Y are not perfect substitutes for each other.

Solution

B will be preferred to D because B contains more of both goods and we assume that consumers prefer more to less.

B will be preferred to both A and C because B = ½A + ½C and we assume that a consumer's tastes exhibit a diminishing marginal rate of substitution.

It is not possible to say whether D is preferred to both A and C. D will either give higher utility than both A and C or lower utility than both A and C or the same utility as both A and C.

Question

Consider two goods, X and Y. Draw four diagrams to illustrate the shape of a consumer's indifference curves under each of the following circumstances.

(i)   The consumer's preferences satisfy the law of diminishing marginal utility.

(ii)   X and Y are perfect complements, *eg* left shoe and right shoe.

(iii)   X and Y are perfect substitutes, *eg* two brands of the same product that are identical.

(iv)   The consumer dislikes X, which yields her only disutility.

Solution

(i)   *Diminishing marginal utility*
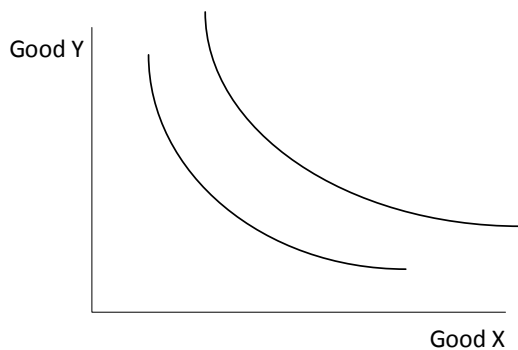
> If each good offers diminishing marginal utility, then the consumer's preferences exhibit a diminishing marginal rate of substitution (*MRS*). Consequently, the indifference curves are strictly convex to the origin.

(ii)   *Perfect complements*
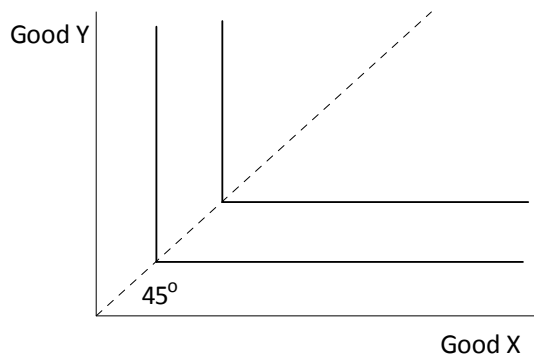
> Good X and Good Y (*eg* left shoe and right shoe) must be consumed jointly in equal quantities and so, by themselves, additional units of either yield no extra utility.

(iii)   *Perfect substitutes*
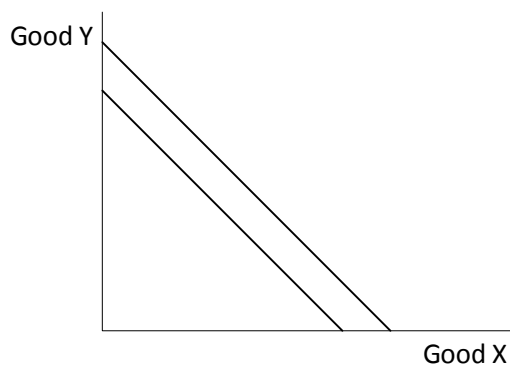
For every unit of Good Y that is given up, one unit of Good X is required to maintain the same level of utility, *ie* the *MRS* is constant.

(iv)   *Good X yields disutility*
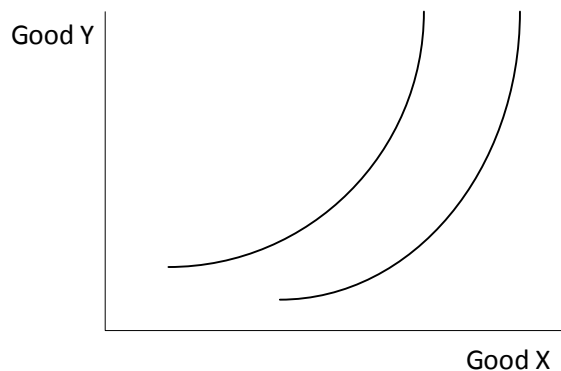
Here the indifference curves slope upwards, as the consumer requires extra Good Y to offset the loss of utility obtained from the consumption of additional units of Good X.

Question

Consider the budget line of a consumer who consumes only two goods, X and Y, with the quantity of Good X represented on the horizontal axis and the quantity of Good Y represented on the vertical axis. If money income is held constant, a rise in the price of Good X and a fall in the price of Good Y will:

A   shift the entire budget line to the left.
B   shift the entire budget line to the right.
C   make the budget line steeper.
D   make the budget line less steep.

Solution

Option C. Given the price changes and axes specified in the question, the consumer would be able to consume less of X if all income is spent on X, and more of Y if all income is spent on Y. Therefore the budget line will become steeper.

Question

A consumer has an income of £200 which can be spent either on Good X or on Good Y. Good X costs £20 per unit and Good Y costs £10 per unit. Good X is an inferior good and Good Y is a normal good. Read parts (i) to (iv) before answering:

(i)   Draw a budget line for the consumer. Label the quantities of Good X and Good Y at the points where the budget line meets the Good X and Good Y axes.

(ii)   Draw an indifference curve for Good X and Good Y at a point where the consumer is maximising satisfaction. Label the curve A, the quantity of X consumed as X1 and quantity of Y consumed as Y1.

(iii)   Show the effect on the budget line of an increase in the consumer's budget to £400. Label the quantities of Good X and Good Y at the points where the budget line meets the Good X and Good Y axes.

(iv)   Draw a new indifference curve for Good X and Good Y on the new £400 budget line at a point where the consumer is maximising his satisfaction. Label this new curve B, the quantity of X consumed as X2 and quantity of Y consumed as Y2.

Solution
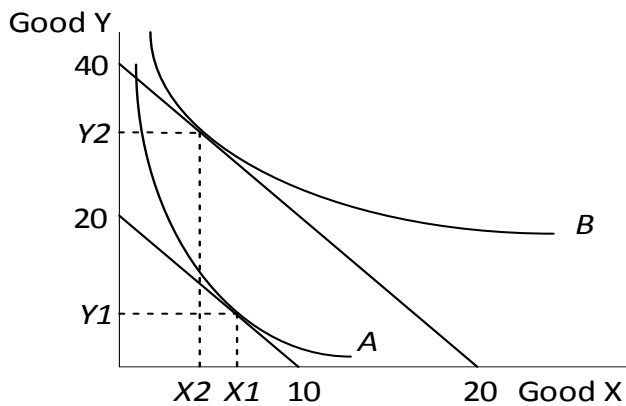
Real income increases so we must leave room for the budget line to shift to the right.

Good X is an inferior good so consumption of Good X must fall.

The equilibrium points can be marked before the indifference curves are drawn.

Question

A consumer has an income of £500 which can be spent either on Good X or on Good Y. Good X costs £20 per unit and Good Y costs £25 per unit. Good Y is a normal good. Read parts (i) to (iv) before answering:

(i)   Draw a budget line for the consumer. Label the quantities of Good X and Good Y at the points where the budget line meets the Good X and Good Y axes and label the budget line B1.

(ii)   Draw an indifference curve for Good X and Good Y at a point where the consumer is maximising satisfaction. Label this original equilibrium position *a*, and the quantity of Good X consumed as X1.

(iii)   The price of Good X falls to £10 per unit. Draw a new budget line, label the quantity of Good X at the point where the budget line meets the Good X axis, and label the budget line B2.

(iii)   To identify the substitution effect of the price change, draw a new budget line that is parallel to the new budget line B2 (therefore reflecting new relative prices) but tangential to the original indifference curve A (therefore representing the original level of utility and real income), and label it B3. Label the tangency point *b* and the quantity of Good X at this point as X'. The movement from X1 to X' is the substitution effect.

(iv)   On the budget line B2, mark the following possible new equilibrium positions:

- *c* for a normal good

- *d* for an inferior but non-Giffen good

- *e* for a Giffen good

and the resulting quantities of Good X demanded as X2c, X2d and X2e.

(v)   For the three types of goods listed above, identify the income effect and the overall price effect.

Solution

(i)-(iv)   *Diagram*
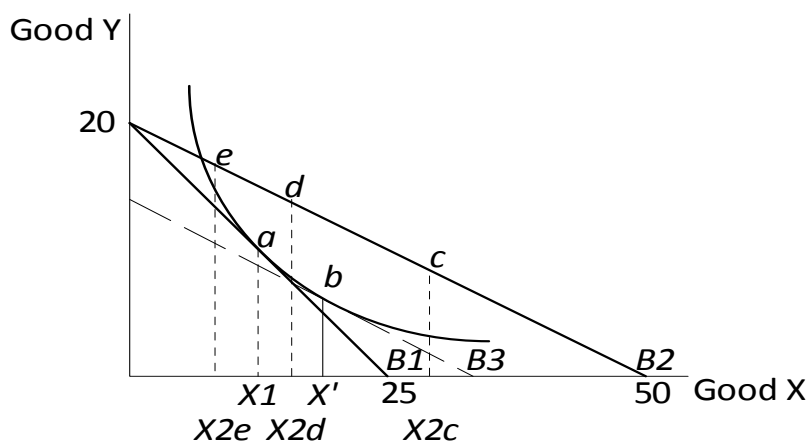
(v)   *Effects of a price fall*

	Substitution effect	*Income effect*	*Price effect*
Normal	X1 to X'	X' to X2c	X1 to X2c (rise)
Inferior (non-Giffen)	X1 to X'	X' to X2d	X1 to X2d (rise)
Giffen	X1 to X'	X' to X2e	X1 to X2e (fall)

Question

(i)   Distinguish between the substitution and income effects of a change in the price of a good.

(ii)   Explain the relationship between the income and substitution effects and the resulting overall impact on demand of a price rise for a normal good, an inferior but non-Giffen good, and a Giffen good.

Solution

(i)   *Substitution and income effects of a change in price*

The *substitution effect* of a price change shows the change in quantity demanded due to the change in relative prices, holding the level of utility (or real income) constant. Consumers substitute the relatively cheaper product for the relatively dearer product. For example, when the price of strawberries increases, the quantity demanded of strawberries decreases because consumers substitute other relatively cheaper goods, *eg* raspberries, in place of strawberries.

The *income effect* of a price change shows the change in the quantity demanded due to the change in real income arising from a price change, holding relative prices constant. If the price of a product rises, the consumer's real income decreases and this affects the quantity demanded.

(ii)   *Substitution and income effects for different types of goods*

The *substitution effect of the price change is always negative*, as consumers always substitute the cheaper for the dearer product, and so a rise in price (with no change in real income) would lead to a fall in quantity demanded.

However, the *income effect of the price change can be negative or positive*. In the case of a normal good, the income effect is negative, because a rise in price and the resulting fall in real income (holding relative prices constant) would lead to a fall in quantity demanded. This means that the substitution and income effects reinforce each other and result in a downward-sloping demand curve.

In contrast, the income effect for an inferior good is positive as price and quantity demanded move in the same direction. This means that the substitution and income effects work in opposite directions and, in the case of a Giffen good, the income effect outweighs the substitution effect and results in an upward-sloping demand curve.

Putting these two effects together means that we have three possible outcomes from a change in price. These are shown in the following table.

	Substitution effect	Income effect	Price effect
Normal	Negative	Negative	Negative
Inferior (non-Giffen)	Negative	Positive	Negative
Giffen	Negative	Positive	Positive

Question

Which of the following statements is TRUE?

A   For a good with a price elasticity of demand equal to –1, the substitution and income effects will be equal and will act in opposite directions.

B   The income effect for an inferior good always acts in the opposite direction to the substitution effect.

C   The income effect will increase the quantity of a normal good demanded if its price increases.

D   The substitution effect will increase the quantity of a Giffen good demanded if its price increases.

Solution

Option B.

If the price elasticity of demand is equal to –1, the overall effect of a price reduction is a proportionate increase in quantity demanded, whereas if the substitution and income effects are equal in magnitude and act in opposite directions, they would cancel each other out exactly, so that quantity demanded remained the same. In this case, the price elasticity of demand would be zero and not –1.

An inferior good is one for which the income and substitution effects act in the opposite direction.

For a normal good the income and substitution effects act in the same direction, so the income effect from a price increase will lead to a *reduction* in quantity demanded.

The substitution effect always *reduces* the quantity demanded in response to a price increase, regardless of the type of good.

4   Demand under conditions of risk and uncertainty

4.1   What's included in this section

- The problem of imperfect information

- Attitudes towards risk

- Diminishing marginal utility and attitudes to risk

- Insurance: a way of removing risks

- Problems for unwary insurance companies

4.2   Guidance

In the previous sections, we assumed that that the utility from consuming a good is known. In practice, however, this is often not the case, *eg* when buying a durable good such as a fridge that is consumed over a period of time or when choosing between investments with uncertain returns.

This material is not new to Subject CB2 but some of it is discussed in greater detail.

4.3   Reading

Task	*√when completed*
Read Chapter 5, pages 129–136.	☐

4.4   Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– consumer durable	☐
– expected value	☐
– certainty equivalent	☐
– risk premium	☐
– diminishing marginal utility of income	☐
– spreading risks (for an insurance company)	☐
– law of large numbers	☐
– independent risks	☐
– diversification	☐
– asymmetric information	☐
– adverse selection in the insurance market	☐
– moral hazard	☐
• explain how the problem of imperfect information affects the purchase of consumer durable goods and assets	☐
• describe a person's attitude to a fair gamble (*ie* when the expected value of the gamble is the same as the certain payoff of not taking the gamble) for:	
– a risk-averse person	☐
– a risk-neutral person	☐
– a risk-loving person	☐
• explain the relationship between the expected value of a gamble, the certainty equivalent of the gamble and the risk premium	☐
• explain why diminishing marginal utility of income accords with risk-averse behaviour	☐
• explain why insurance companies are able to make profits	☐
• explain why and how the problems of adverse selection (unobservable characteristics) and moral hazard (unobservable actions) affect insurance companies and how these problems can be dealt with.	☐

4.5   Questions

Question

Suppose there are two investment alternatives that an investor can afford, A and B. Investment A will generate a revenue of £1,000 per year for certain and B will generate a revenue of either £500, £1,000 or £1,500 per year with equal probability of one-third. Assuming that the acquisition cost of each investment is equal, which one of the following statements is always TRUE?

A   A risk-loving investor will choose Investment A.

B   The expected rate of return for Investment B is lower than for Investment A.

C   A risk-averse investor will choose Investment A.

D   A risk-neutral investor will choose Investment B.

Solution

Option C. The first thing to note is that Investments A and B both offer the same expected return of £1,000 per year and so Option B is incorrect. A *risk-loving* investor is one who will always choose to accept a gamble if the odds are fair. Given that Investments A and B offer the same expected return, the risk-loving investor will choose the riskier alternative, *ie* Investment B. Conversely, a *risk-averse* investor will choose Investment A precisely because it is less risky. A *risk-neutral* investor will be indifferent between Investment A and Investment B, and therefore might choose Investment B, but will not always do so.

Question

Which of the following is NOT true about a risk-averse investor?

A   He or she will reject a fair gamble.

B   He or she will avoid all risk.

C   The marginal utility of wealth decreases as wealth increases.

D   The insurance premium can be greater than the long-run average value of claims.

Solution

Option B. A risk-averse investor will always reject a gamble if the odds are fair (Option A). He or she will value an incremental gain in wealth less than the same incremental decrease in wealth precisely because the marginal utility of wealth decreases as wealth increases (Option C). In addition, the insurance premium that a risk-averse person is prepared to pay is greater than the long-run average value of claims in order to reduce or remove the risk that they face (Option D). However, we cannot say that a risk-averse person will avoid all risk. All we can say is that a risk-averse person might accept a gamble if the expected value of the gamble is greater than the certain payoff from not taking the gamble.

Question

Which of the following is TRUE?

A   The risk premium is the difference between the expected value of a gamble and the certain payoff of not taking the gamble.

B   The risk premium is negative for risk-loving people.

C   For risk-averse people, the expected value of a fair gamble is less than the certainty equivalent of the gamble.

D   The certainty equivalent of the gamble is the initial amount of wealth held.

Solution

Option B. The *risk premium* is the expected value of a gamble minus the person's certainty equivalent of the gamble (so Option A is incorrect), where the *certainty equivalent* is the certain amount of money that would give the person the same amount of utility as the expected value of the gamble (so Option D is incorrect). For risk-loving people, the risk premium is negative because the expected value of the gamble is less than the certainty equivalent. (For risk-neutral people, the risk premium is zero because the expected value of the gamble is equal to the certainty equivalent. For risk-averse people, the risk premium is positive because the expected value of the gamble is greater than the certainty equivalent of the gamble (so Option C is incorrect).)

Question

(i)   Define the following problems for insurance companies:

    (a)   adverse selection

    (b)   moral hazard.

(ii)   A person is diagnosed as suffering from lung cancer caused by excessive smoking, and therefore tries to take out a life assurance contract without telling the life insurance company about the cancer.

    Explain whether this is an example of moral hazard or of adverse selection.

(iii) Discuss what an insurance company can do to reduce the problems of:

    (a)   adverse selection

    (b)   moral hazard.

Solution

(i)(a)   *Adverse selection* describes the fact that people who know that they are particularly bad risks are more inclined to take out insurance than those who know that they are good risks.

(i)(b)   *Moral hazard* describes the fact that policyholders may, because they have insurance, act in a way that makes the insured event more likely. This temptation to take more risk occurs because the policyholder knows that insurers will cover the risk.

(ii)   This is an example of adverse selection because the person represents a bad risk. It is not moral hazard, because taking out the insurance policy does not change the person's subsequent behaviour in a way that increases the risk of death.

         Both problems arise as a result of asymmetric information. The insurance company knows less about the policyholder's characteristics and behaviour than the policyholder does.

(iii)(a) To try and reduce the problems of adverse selection, insurance companies screen potential policyholders to try to find out lots of information about them. Policyholders can then be put in small, reasonably homogeneous pools and charged appropriate premiums.

(iii)(b) The company could try to monitor the actions of the policyholder, but this might be difficult, intrusive and expensive. Alternatively, the company could offer incentives to change the policyholder's behaviour. For example, the company could:

         –   make the policyholder pay an excess, *ie* the first £X of any claim

         –   offer no-claims discounts, *ie* lower premiums in the future if the policyholder doesn't claim

         –   apply exclusions, *eg* refuse to pay claims if the policyholder doesn't take reasonable care (*eg* lock the car).

5   Behavioural economics

5.1   What's included in this section

- What is behavioural economics?

- Bounded rationality

- Framing and the reference point for decisions

- Taking other people into account

- Implications for economic policy

5.2   Guidance

As a guide to the reading, the following might be of help:

- Behavioural economics has come to the fore in recent years as an attempt to explain why, in practice, people don't always act in accordance with standard economic theory.

- Box 5.4 describes 'nudge theory', which has been very influential and was recently brought to our attention by the awarding of the 2017 Nobel prize for economics to one of its proponents, Richard Thaler. Many interesting examples are given, *eg* 'opt-out' versus 'opt-in' schemes for organ donation and pension contributions.

- This material is new to Subject CB2.

5.3   Reading

Task	√*when completed*
Read Chapter 5, pages 136–146.	☐

5.4   Checklist

Task	√ when completed
Ensure that you can:	
• define the following key terms:	
– bounded rationality	☐
– heuristic	☐
– framing	☐
– nudge theory	☐
– reference-dependent loss aversion	☐
– endowment effect (or divestiture aversion)	☐
– time consistency	☐
– present bias	☐
– reciprocity (in economics)	☐
• explain how behavioural economics differs from traditional economics	☐
• discuss the validity of the assumption of rationality in economic theory	☐
• explain why behavioural economics has grown in importance in recent years	☐
• give examples of what has been learned from behavioural economics about consumer choice in terms of:	
– the number of choices on offer	☐
– the time, effort and expense involved in obtaining more information about potential options	☐
– different strategies used by consumers in situations of bounded rationality and the factors affecting consumer responses	☐
– the way in which choices are presented (or framed)	☐
– the biases or preconceptions people have	☐
– the reference points for decision making (*eg* own expectations, decisions of others, current or past position, ownership/non-ownership)	☐
– consistency/inconsistency of preferences over time	☐
– the effect it will have on others	☐
– the influence of others and possible herd behaviour	☐
• describe the role of behavioural economics in designing economic policy.	☐

5.5   Questions

Question

Behavioural economics differs from traditional economics in all of the following ways except one. Which is the exception?

A   It uses experiments to test its theories.

B   It assumes that people act rationally.

C   It is interested in the way in which people behave in groups.

D   It is concerned with the ways in which people cope with imperfect information.

Solution

Option B. *Traditional* economic theory assumes that people behave rationally. Even if traditional economists recognise that people do not behave rationally all of the time, they assume that any mistakes resulting from irrational choices would balance out on average. Behavioural economists recognise that people act *irrationally* – they act out of habit, on impulse, are influenced by group behaviour, and have to make decisions with imperfect information. Although experiments are rarely used by traditional economists, they are often used by behavioural economists.

Question

Describe the role of behavioural economics in the design of economic policy.

Solution

Economic policy is often designed to change behaviour to meet economic objectives. For example, taxes are imposed on tobacco in order to discourage its use and hence improve health; subsidies are given to public transport to encourage its use and hence reduce congestion and pollution; income tax might be cut to increase spending and/or increase the incentive to work. Traditional economic theory predicts that people respond in a particular way to a change in a particular variable.

Behavioural economics might add to our understanding of how people behave and why they behave in a particular way. This understanding might then lead to the development of alternative strategies for achieving the desired result. For example, 'nudge theory' suggests that people often need a 'nudge' to persuade them to re-think many of the decisions that they currently make 'out of habit' or according to simple rules, such as 'this is more expensive, so it must be better quality'. Policies that have been successful include new pension arrangements introduced in 2012, under which pension contributions are automatically deducted from employees' wages unless they opt out of the scheme (such 'opting out' schemes have much higher participation rates than 'opting in' schemes). Studies show that letters to late taxpayers telling them that most people had already paid their tax, and letters to the wealthy explaining how their taxes would help improve local services both resulted in increased payment rates.

The practice questions start on the next page so that you can
keep the practice questions and solutions together for revision purposes.

Module 5 Practice Questions

5.1   The law of diminishing marginal utility applied to consumption of Good X implies that the:

A   more one consumes of Good X, the less utility one derives from the first unit of
       consumption of Good X.

B   total utility derived from the consumption of Good X increases by smaller amounts for
       each extra unit of Good X consumed.

C   marginal utility derived from the consumption of an extra unit of Good X falls if the price
       of Good X falls.

D   marginal utility derived from the consumption of an extra unit of Good X falls if the price
       of Good X rises.   [1½]

5.2   Which of the following is a measure of total consumer surplus?

A   Marginal utility minus the price of the good.

B   The total utility consumers get from the consumption of the good.

C   The total utility consumers get from consumption of the good less the total expenditure
       on the good.

D   Marginal utility times the price of the good.   [1½]

5.3   A consumer has £2.00 of income which is entirely spent on Good X and Good Y. Good X costs 20
       pence, Good Y costs 40 pence.

The relevant marginal utilities for the consumer are:

Quantity of Good X	Marginal utility of Good X	Quantity of Good Y	Marginal utility of Good X
1	100	1	170
2	80	2	120
3	60	3	80
4	40	4	60
5	20	5	50
6	10	6	40

(i)   Calculate the quantity of Good X and Good Y the utility-maximising consumer will buy. [2]

(ii)   State the total utility of the consumer when utility is maximised.   [1]

(iii) If the consumer's income is doubled to £4 and the price of Good X is doubled to 40 pence,
       calculate the new utility-maximising quantities of Goods X and Y purchased.   [1]
                                                                                        [Total 4]

5.4 A change in consumer tastes would change:

Exam style

A the marginal rate of substitution.

B the slope of the budget line.

C the position of the budget line.

D none of the above. [1½]

5.5 Consumer A purchases Good X and Good Y. If Consumer A's income and the prices of Good X and Good Y double Consumer A's budget line will:

Exam style

A remain unchanged.

B shift to the right but not change slope.

C shift to the right and become steeper.

D shift to the right and become less steep. [1½]

5.6 The budget line for a particular consumer is given as:

Exam style

$$3Q_x + 2Q_y = 30$$

where Q_x is the quantity of Good X and Q_y is the quantity of Good Y.

Note that Goods X and Y can only be consumed in whole units.

Which of the following is TRUE?

A The price of Good X is 2.

B The consumption bundle consisting of 3 units of Good X and 10 units of Good Y is on the consumer's budget line.

C If the consumer decides to buy as many units as possible of Good X, he will still have enough income left over to buy one unit of Good Y.

D A rational consumer will choose a consumption bundle such that his marginal rate of substitution of Good X for Good Y is equal to –1.5. [1½]

5.7 A Giffen good has an income elasticity of demand that is:

Exam style

A negative.

B positive.

C zero.

D indeterminate. [1½]

5.8 Which one of the following provides an economic explanation of risk aversion?

Exam style

A The marginal utility of an extra pound of income increases as more income is earned.

B There will always be some individuals willing to take risks while others will be unwilling to assume risks regardless of the payoff.

C The marginal utility of an extra pound of income decreases as more income is received.

D The marginal rate of substitution between winning and risk is constant. [1½]

5.9   Adverse selection describes the fact that people who know that they are particularly:

Exam style   A   bad risks are more inclined to take out insurance than those who know that they are good
                     risks. High premiums should be charged to all policyholders.

            B   good risks are more inclined to take out insurance than those who know that they are bad
                     risks. Appropriate premiums should be charged to all policyholders.

            C   bad risks are more inclined to take out insurance than those who know that they are good
                     risks. Appropriate premiums should be charged to all policyholders.

            D   good risks are more inclined to take out insurance than those who know that they are bad
                     risks. Low premiums should be charged to all policyholders.   [1½]

5.10   (i)   Explain what is meant by 'bounded rationality'.   [2]

Exam style   (ii)   Describe strategies that individuals use to cope with this situation and the factors that
                     might determine how they behave.   [3]
                                                                                                         [Total 5]

The solutions start on the next page so that you can
separate the questions and solutions.

Module 5 Solutions

5.1   *This question is Subject CT7, September 2005, Question 3.*

Option B. The *law of diminishing marginal utility* states that the increase in the total utility derived from the consumption of a good decreases with each additional unit consumed. In other words, utility increases, but at a decreasing rate.   [1½]

5.2   *This question is Subject CT7, April 2013, Question 5.*

Option C. *Total consumer surplus* is the excess of what the person *would have* paid over what the person *actually* paid for the goods consumed and so represents the total utility gained less the total expenditure.   [1½]

5.3   *This question is Subject 107, April 2002, Question 27.*

(i)   ***Utility-maximising consumption***

Quantity of Good X	Marginal utility of Good X	Total utility of Good X	Quantity of Good Y	Marginal utility of Good Y	Total utility of Good Y
1	100	100	1	170	170
2	80	180	2	120	290
3	60	240	3	80	370
4	40	280	4	60	430
5	20	300	5	50	480
6	10	310	6	40	520

To maximise total utility, the consumer should find possible combinations of Good X and Good Y that equalise the marginal utilities per penny spent (or alternatively, that equalise the ratio of the marginal utilities and the ratio of the prices).

$$\frac{MU_X}{p_X} = \frac{MU_Y}{p_Y} \qquad \text{or} \qquad \frac{MU_X}{MU_Y} = \frac{p_X}{p_Y}$$

Since the price of Good Y is twice the price of Good X, the marginal utility of Good Y must be twice the marginal utility of Good X.

The following combinations are possible.

Combination	Total utility from the combination	Cost of the combination
$3X + 2Y$	530	£1.40
$4X + 3Y$	650	£2.00
$5X + 6Y$	820	£3.40

[1 for list of possible combinations]

Since income is limited at £2.00, the utility-maximising combination is $4X + 3Y$.   [1]

This method will not always work in questions like this because the items are not always divisible into small enough units. If the method does not work, trial and error must be used. Trial and error can always be used in this type of question by considering (1) what combinations are affordable and (2) which gives the highest total utility. Full marks are awarded for the correct answer, however obtained.

(ii)   ***Total utility***

The total utility of this combination is $280 + 370 = 650$.   [1]

(iii)   ***New utility-maximising combination***

If the price of Good X is now the same as the price of Good Y, we want combinations of Good X and Good Y where the marginal utility of Good X is equal to the marginal utility of Good Y. The following combinations are possible.

Combination	Total utility from the combination	Cost of the combination
$2X + 3Y$	550	£2.00
$3X + 4Y$	670	£2.80
$4X + 6Y$	800	£4.00

Since income is £4, the consumer will choose $4X + 6Y$.   [1]

5.4   Option A.

A consumer's indifference curve reflects the consumer's preferences. The budget line displays what the consumer can afford, given the consumer's income and the prices of the goods.

A change in consumer tastes would therefore change the indifference curve. The absolute value of the gradient of the indifference curve is equal to the marginal rate of substitution, *ie* the amount of one good the consumer would be willing to give up to obtain another unit of the other good. A change in tastes would therefore change the marginal rate of substitution (and hence the slope of the indifference curve).   [1½]

5.5   *This question is Subject CT7, September 2005, Question 8.*

Option A. The budget line shows the combinations of Goods X and Y that Consumer A can purchase if all income is spent on the two goods. If both prices double and income also doubles, then exactly the same bundles of goods as before could be purchased. Consequently, the budget line should be unchanged.   [1½]

5.6   *This question is Subject 107, September 2002, Question 5.*

Option D.

The budget line is given as:

$$3Q_x + 2Q_y = 30$$

so we know that the price of Good X is 3, the price of Good Y is 2 and the consumer's income is 30.

We can rearrange the equation as follows:

$$2Q_y = 30 - 3Q_x$$
$$Q_y = 15 - 1.5Q_x$$

Hence we can draw the budget line.
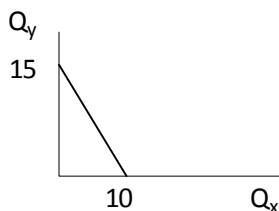
At equilibrium, the slope of the indifference curve (which is the marginal rate of substitution of Good X for Good Y) is equal to the slope of the budget line. The slope of the budget line is -1.5.
                                                                                    [1½]

5.7   Option A. Giffen goods must be inferior goods and therefore they have a negative income elasticity of demand. In the case of Giffen goods, the positive income effect of a price change outweighs the negative substitution effect of a price change, so that the *price* elasticity of demand is positive.   [1½]

5.8   Option C. A risk-averse individual will reject a fair gamble because the increase in utility from an incremental increase in income is lower than the decrease in utility from an incremental decrease. This is precisely because the marginal utility of income decreases with income. Option A is simply the opposite of the truth. Option B may be true but it does not give an 'economic explanation of risk aversion'. The meaning of Option D is unclear.   [1½]

5.9   *This question is Subject 107, April 2003, Question 13.*

Option C. The first sentence in Option C is the definition of adverse selection. This is the same as the first sentence in Option A. The second sentence in Option C is not part of the definition of adverse selection; it is the correct response of the insurance companies to the problem. This was not strictly asked for in the question, but Option C is the more sensible option to choose.   [1½]

5.10   (i)   *Bounded rationality* is a situation in which the ability to make rational decisions is limited:
                                                                                                            [½]

        •   by lack of information   [½]

        •   by lack of time, effort, and perhaps expense, of obtaining the relevant information
                                                                                                            [½]

        •   by a lack of understanding of complex situations.   [½]
                                                                                                    [Total 2]

        (ii)   When in a situation of bounded rationality, individuals often resort to *heuristics*, *ie* the use of strategies that draw on simple lessons from past experience when faced with similar, though not identical, choices.   [1]

                For example, when considering a new type of product, a consumer might:

        •   buy a well-liked brand (brand loyalty)   [½]

        •   stick to 'rules of thumb', *eg* 'Angela buys this and she knows about these
                things'   [½]

        •   engage in 'trial and error', *ie* try out a new product and base future behaviour on
                this experience.   [½]

                Factors affecting the choice of strategy include the consumer's:

        •   attitude to risk   [½]

        •   degree of optimism or pessimism   [½]

        •   desire for individuality/self-expression or desire to conform.   [½]
                                                                                                  [Maximum 3]

6

Background to supply

Syllabus objectives

2.4   Discuss the production function, costs of production, revenue and profit in order
       to understand a firm's price and output decisions.

   1.   Explain how the production function reflects the relationship between
         inputs and outputs in the short and long run.

   2.   Define average and marginal physical product.

   3.   Describe the meaning and measurement of costs and explain how these
         vary with output in the short and long run.

   4.   Define total, average and marginal costs.

   5.   Describe what is meant by 'economies of scale' and explain the reasons for
         such economies and how a business can achieve efficiency in selecting the
         level of its inputs.

   6.   Describe revenue and profit and explain how both are influenced by
         market conditions.

   7.   Define and calculate average and marginal revenue.

   8.   Describe how profit is measured and explain how the firm arrives at its
         profit-maximising output.

   9.   Explain what is meant by the 'shut-down' point in the short and long run.

Core Reading

Chapter 6   *Pages 148–186*
                                    (excluding isoquant analysis on pages 166–170, 175–176)

0   Introduction

Economists typically assume that firms aim to maximise profits, which are equal to revenues less costs. Firms therefore need to understand both their costs and revenues in some detail.

In this module we:

- build up a theory of production and costs in the short run and long run

- consider revenues

- put costs and revenues together to determine the output level that maximises profits

- consider the circumstances under which it is better for a firm not to produce anything at all.

1 The short-run theory of production

1.1 What's included in this section

- Short-run and long-run changes in production

- The law of diminishing returns

- The short-run production function: total physical product

- The short-run production function: average and marginal product

1.2 Guidance

This material (along with the other sections in this module) were frequently examined in Subject CT7 (and its predecessors), usually as multiple-choice and short-answer questions, although long-answer questions also appeared from time to time.

It is essential to know and understand the material in this section as it acts as some of the main building blocks for the remainder of this module, and for the following two modules.

In particular, it is important to be happy with the differences between:

- fixed and variable factors of production

- the short and long run

- total, average and marginal concepts in general

- total, average and marginal physical product.

Expressed in *words*, 'marginal' always represents the additional amount of a variable in response to an increase of one unit of another variable. Note that in *mathematical terms*, this corresponds to a derivative. So, the *MPP* is the *derivative* of *TPP* with respect to the quantity of labour. Boxes 6.3 and 6.4 are useful for *understanding* the relationship between total, average and marginal concepts.

Past exam questions have often required simple calculations to be performed based on these concepts. It might also be necessary to produce drawings of total, average and marginal physical product, either as a direct requirement of exam questions, or to help to determine the correct option in multiple-choice questions, so it's worth starting to practise drawing these diagrams now.

Finally, it is also important to remember that the *law of diminishing returns* operates in the *short run*, as it tells us how output varies with the addition of extra units of a variable when at least one other factor is *fixed*.

1.3 Reading

Task	√*when completed*
Read Chapter 6, pages 149–155.	☐

1.4   Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– rational producer behaviour	☐
– theory of the firm	☐
– fixed factor	☐
– variable factor	☐
– short run	☐
– long run	☐
– total physical product (*TPP*)	☐
– average physical product (*APP*)	☐
– marginal physical product (*MPP*)	☐
– production function	☐
– technical efficiency	☐
• state the law of diminishing marginal returns	☐
• state the relationship between averages and marginals	☐
• calculate numerical values for *TPP*, *APP* and *MPP*	☐
• draw the typical *TPP*, *APP* and *MPP* curves.	☐

1.5   Questions

Question

State which of the following factors of production are likely to be classed as fixed, and which are likely to be classed as variable.

(i)   a manager employed on a contract requiring one year's notice of dismissal

(ii)   a shop-floor worker employed on a contract requiring one week's notice

(iii)   electricity

(iv)   raw materials.

Solution

(i)   The manager on a contract requiring one year's notice of dismissal is probably a fixed factor of production.

(ii)   The shop-floor worker on a contract requiring one week's notice is probably a variable factor of production.

(iii)   The quantity of electricity used can be altered quickly. Therefore electricity is a variable factor of production. However, some elements of the firm's electricity bills may be fixed, *eg* the standing charge, costs of light and heating which are incurred whatever the level of output. An alternative source of power (*eg* gas) can only be installed in the long run.

(iv)   Raw materials are a variable factor of production.

Past exam questions have typically assumed labour to be variable and capital fixed. Although employment protection legislation exists in many developed countries, labour is still easier to change than, say, a factory.

Question

Complete the following table to show the marginal physical product of labour (MPP_L).

Number of workers	Output (goods per day)	MPP_L
0	0.0	
1	2.3	
2	5.0	
3	8.0	
4	10.0	
5	11.8	
6	13.0	
7	14.0	
8	14.8	
9	15.3	
10	15.0	

Solution

Number of workers	Output (goods per day)	MPP_L
0	0.0	
		+2.3
1	2.3	
		+2.7
2	5.0	
		+3.0
3	8.0	
		+2.0
4	10.0	
		+1.8
5	11.8	
		+1.2
6	13.0	
		+1.0
7	14.0	
		+0.8
8	14.8	
		+0.5
9	15.3	
		−0.3
10	15.0	

2 Costs in the short run

2.1 What's included in this section

- Measuring costs of production

- Costs and inputs

- Total cost

- Average and marginal costs

2.2 Guidance

As in the previous section, it is important to:

- get to grips with the relationships between the various costs

- be able to calculate numerical values of various costs

- be able to draw diagrams of how the costs vary with output.

The previous section showed that the *APP* and *MPP* curves have inverted 'U' and 'J' shapes, with the *MPP* cutting the highest point on the *APP* curve.

In contrast:

- the average cost (*AC*) curve has a 'U' shape

- the marginal cost (*MC*) curve has a 'J' shape and cuts the *AC* curve at its minimum

- the average variable cost (*AVC*) curve has a similar shape to the *AC* curve, lies below it, and converges up towards it as output increases.

The 'Looking at the Maths' section may be useful for understanding the concepts and the relationship between them.

Box 6.7 illustrates that it is possible to draw curves with slightly different shapes, but try not to get distracted too much from the standard shapes, as these are the ones upon which most exam questions will be based.

2.3 Reading

Task	√ when completed
Read *Chapter 6*, pages 155–161.	☐

2.4 Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– explicit costs and implicit costs	☐
– sunk costs	☐
– historic costs	☐
– fixed costs (or total fixed cost, TFC)	☐
– variable costs (or total variable cost, TVC)	☐
– total cost (TC)	☐
– average total cost (AC)	☐
– average fixed cost (AFC)	☐
– average variable cost (AVC)	☐
– marginal cost (MC)	☐
• explain how to measure the opportunity cost of any production decision for a firm	☐
• state the bygones principle	☐
• draw diagrams showing the typical relationships between:	
– TC, TFC and TVC	☐
– AC, AFC, AVC and MC	☐
• calculate numerical values for the different types of costs.	☐

2.5 Questions

Question

Which of the following statements is FALSE?

A   The bygones principle states that opportunity costs should be ignored when deciding whether to produce or sell more or less of a product.

B   Opportunity costs are implicit costs when the firm already owns the factors of production it has used to incur the cost.

C   The bygones principle states that sunk costs should be ignored when deciding whether to produce or sell more or less of a product.

D   Opportunity costs are explicit costs when the firm has to buy the factors of production from a third party.

Solution

Option A.

The bygones principle is as stated in Option C. Sunk costs are those that cannot be recouped, *eg* the costs of an advertising campaign or the cost of a tailor-made display cabinet that is of no use to anyone else. When choosing a particular course of action, *eg* whether or not to shut down, sunk costs are ignored because they have no opportunity cost. Most fixed costs are sunk costs. However, if a machine did have an opportunity cost, *eg* if another firm was interested in buying it, then its resale value would be considered when making the shut-down decision.

For simplicity, we usually assume that all fixed costs are sunk costs. Therefore, we say that the firm would, in the short run, remain in production as long as the revenue earned from production exceeds the extra costs incurred in production, *ie* as long as total revenue is greater than or equal to total variable cost.

Question

(i)   State which element of a firm's total costs will influence its short-run marginal costs.

(ii)   Distinguishing between fixed and variable costs, explain the shape of the short-run average cost curve.

Solution

(i)   *Short-run marginal costs*

Marginal cost is the addition to total costs as a result of producing one more unit of output. Because fixed costs (by definition) do not change with output levels, short-run marginal cost is equal to the increase in short-run variable costs.

(ii)   *Shape of the short-run average cost curve*

The shape of the short-run average cost curve depends on the shape of its two components: the average fixed cost curve and the average variable cost curve.

The average fixed cost curve falls continuously with output since the total fixed cost is being spread over an increasing number of units of output.

The average variable cost curve is typically U-shaped. The average variable cost falls at first as increasing returns to the variable factor are experienced. Ultimately diminishing returns to the variable factor set in and hence the average variable cost rises.

Since both components fall at first, then the average cost curve falls. The average cost eventually rises because the rise in average variable cost is likely to outweigh the fall in average fixed cost.

Question

Give two examples of fixed costs and two examples of variable costs.

Solution

Fixed costs – Possible answers include rent and rates on factories and offices, salaries of skilled workers, standing charge elements of telephone and electricity bills, cost of capital.

Variable costs – These typically include wages for unskilled workers, stationery, costs of telephone calls and of metered electricity.

Question

Complete the following table to show the average cost (AC) and marginal cost (MC).

Output	Total cost	Average cost	Marginal cost
0	10.00	∞	
1	11.00		
2	11.51		
3	12.41		
4	14.00		
5	16.46		
6	19.91		
7	24.44		
8	30.12		
9	37.00		
10	45.13		

Solution

Output	Total cost	Average cost	Marginal cost
0	10.00	∞	
			+1.00
1	11.00	11.00	
			+0.51
2	11.51	5.76	
			+0.90
3	12.41	4.14	
			+1.59
4	14.00	3.50	
			+2.46
5	16.46	3.29	
			+3.45
6	19.91	3.32	
			+4.53
7	24.44	3.49	
			+5.68
8	30.12	3.77	
			+6.88
9	37.00	4.11	
			+8.13
10	45.13	4.51	

Question

The area below the firm's marginal cost curve represents:

A   the firm's total costs.
B   the firm's total variable costs.
C   the firm's total fixed costs.
D   the firm's total profit.

Solution

Option B. Remember that:

- marginal cost can be thought of as the *derivative* of total cost. So, summing or integrating the area under the marginal cost curve reverts back to (some form of) total costs.

- marginal cost indicates how costs vary with the level of output. It therefore reflects *variable costs*, but not fixed costs, which do not vary with the level of output.

Question

Draw a diagram showing the typical shapes of, and relationships between, the short-run:

(i)   total cost (TC), total variable cost (TVC) and total fixed cost (TFC) curves.

(ii)   marginal cost (MC), average cost (AC), average variable cost (AVC) and average fixed cost (AFC) curves.

Solution

(i)   *Short-run TC, TVC and TFC curves*
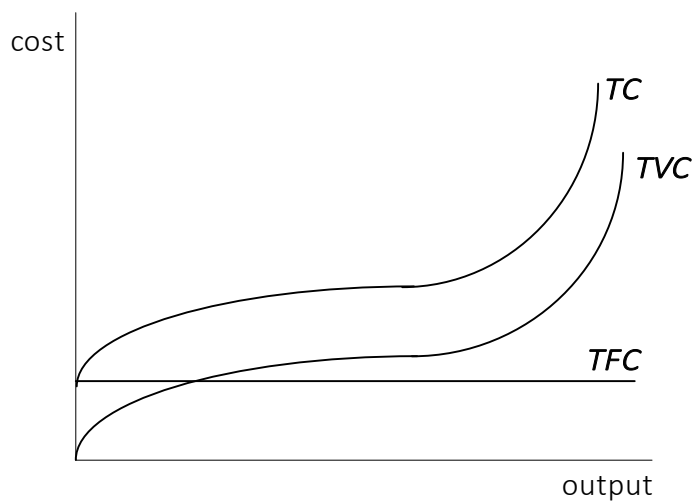
(ii)   *Short-run MC, AC, AVC and AFC curves*
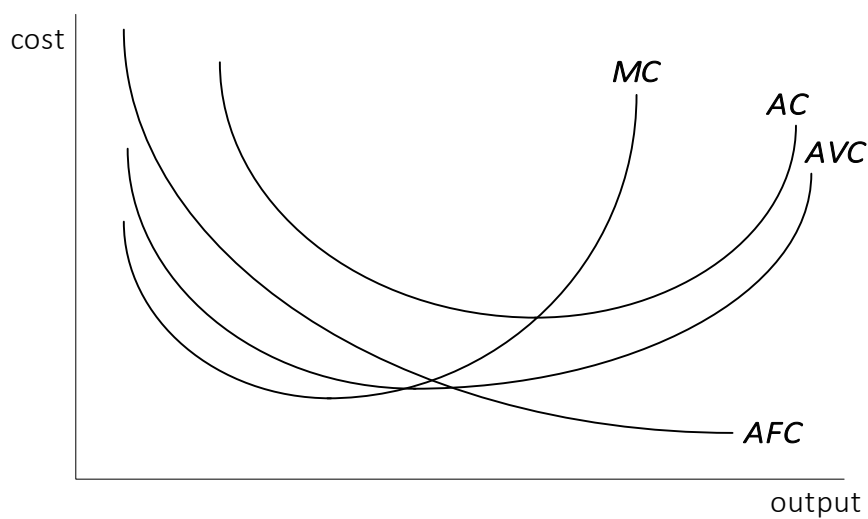
3 The long-run theory of production

3.1 What's included in this section

- The scale of production

- Location

- The size of the whole industry

- The optimum combination of factors: the marginal product approach

- Decision making in different time periods

3.2 Guidance

It is important to be aware of the difference between the short run (in which at least one factor input is fixed) and the long run (when all factor inputs can be varied). Section 1 describes diminishing marginal returns, which is a short-run concept, whereas this section describes diseconomies of scale, which is a long-run concept. Students frequently confuse the two, and as a result arrive at the wrong answer. (Note that it is the influence of economies and diseconomies of scale that lead to the long-run average cost curve typically having a 'U' shape.)

There are a few lists in this section relating to economies and diseconomies of scale and this is useful bookwork to learn as it's not uncommon to see an exam question asking students to list / describe economies / diseconomies of scale.

Note that the section on isoquants and isocosts is not part of the Core Reading and so is not examinable.

3.3 Reading

Task	√*when completed*
Read Chapter 6, pages 161–171, excluding the material on isoquants / isocosts on pages 166-170.	☐

3.4   Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– economies of scale	☐
– specialisation and division of labour	☐
– indivisibility	☐
– plant economies of scale	☐
– rationalisation	☐
– overheads	☐
– economies of scope	☐
– diseconomies of scale	☐
– external economies of scale	☐
– industry's infrastructure	☐
– external diseconomies of scale	☐
– productive efficiency	☐
– Cobb-Douglas production function.	☐
• distinguish between increasing, constant and decreasing returns to scale	☐
• describe six factors that lead to plant economies of scale	☐
• describe four other possible economies of scale	☐
• describe four factors that may lead to diseconomies of scale	☐
• state two factors that will influence the choice of location	☐
• state the condition for the cost-minimising combination of factors in both the two-factor and multi-factor case	☐
• distinguish between the very short run, the short run, the long run and the very long run.	☐

3.5   Questions

Question

Which of the following is NOT a source of economies of scale?

A   indivisibilities
B   multistage production
C   industrial relations
D   the container principle

Solution

Option C. Industrial relations that deteriorate with distant management, poor communication and specialisation are a possible reason for *diseconomies* of scale.

Question

What is normally regarded as the main reason for diseconomies of scale?

A   indivisibilities
B   managerial factors
C   increasing pollution
D   the opportunity cost of production

Solution

Option B. Option A is an *economy* of scale. Options C and D are neither economies nor diseconomies of scale.

Question

Describe how a firm that manufactures cars may experience economies of scale.

Solution

A car manufacturer might experience the following economies of scale:

1.   *Specialisation and division of labour* – In large car plants, assembly-line production allows workers to specialise in specific tasks, thus increasing proficiency at the task, saving both training and supervisory costs. Time is also saved as workers do not have to switch from one activity to the next.

2.   *Indivisibilities* – Some equipment (*eg* a car assembly line) and some processes (*eg* R&D) have to be of a certain minimum size. A small firm could not make full use of these things but large firms benefit from the lower average costs that such facilities allow.

3.   *Greater efficiency of large machines* – A larger machine (*eg* a spray-painting machine) that has twice the output of a smaller machine may not cost twice as much to build or run. For example, it might still only need one person to operate it and it might make more efficient use of raw materials, *eg* paint.

4.   *Economies of scope* – A large car manufacturer will probably produce a large range of cars and this might enable the cost per car to be lower than it would be if it were a single-car producer. For example, technology that it develops for one car is transferable to other cars; experience gained in marketing one car in a particular country makes it easier to market other cars in that country.

Other economies of scale, *eg* financial economies, multi-stage production, organisational economies and spreading overhead costs, may also be relevant.

Question

Explain how might diseconomies of scale be reduced or removed.

Solution

Many diseconomies can be reduced or removed by *replication*:

Suppose the long-run average cost curve seems to slope upwards after, say, output of 10,000 units per week. All that is required to produce 100,000 units is ten identical plants producing 10,000 units. This should give almost identical average costs to a single 10,000-unit firm. This is one of the principles behind the franchised structure of companies such as McDonalds and Benetton.

It might only need one extra manager to oversee many replicated firms.

Dilution of ownership can be overcome by narrowly identifying 'profit centres' within an organisation, *eg* giving profit-related incentives to staff based on their own work area, rather than on the whole organisation's performance.

Question

State the formula for the least-cost combination of factors.

Solution

In the case of $N > 2$ factors, the least-cost combination of factors occurs when:

$$\frac{MPP_A}{P_A} = \frac{MPP_B}{P_B} = \frac{MPP_C}{P_C} = \ldots = \frac{MPP_N}{P_N}$$

4   Costs in the long run

4.1   What's included in this section

- Long-run average costs

- Long-run marginal costs

- The relationship between long-run and short-run average cost curves

- Long-run cost curves in practice

4.2   Guidance

In this final section on costs, we consider the factors that influence long-run costs and the relationship between short-run and long-run costs, so we should now have a complete picture of costs and be able to draw all the various cost curves.

Note that the section on isoquants is not part of the Core Reading and so is not examinable.

4.3   Reading

Task	√*when completed*
Read Chapter 6, pages 172–176, excluding the material on isoquant maps on pages 175-176.	☐

4.4   Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– long-run average cost (*LRAC*) curve	☐
– long-run marginal cost (*LRMC*)	☐
– envelope curve	☐
• describe how long-run average costs typically vary with output	☐
• outline three assumptions underlying long-run average costs curves	☐
• explain, with the aid of a diagram, the relationship between short-run and long-run average costs	☐
• explain what is meant by the term minimum efficient scale (MES).	☐

4.5   Questions

Question

With the aid of a diagram, explain the typical relationship between long-run and short-run average cost curves.

Solution

The diagram shows a typical pattern of short-run and long-run average costs.
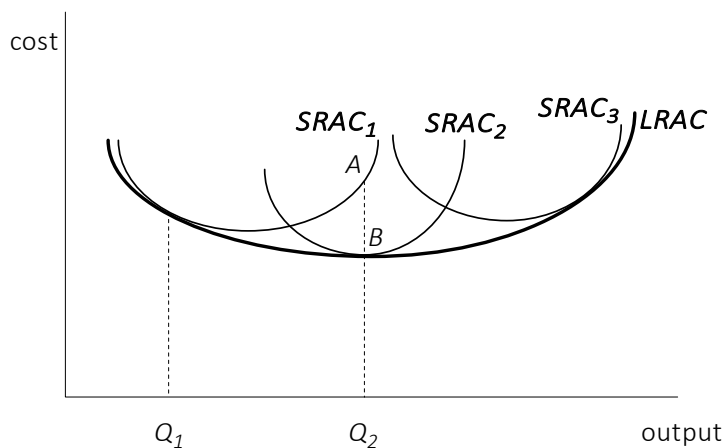
In the long-run, the quantities of all input factors can be varied, in particular, the level of capital can be varied. *LRAC* is the long-run average cost when it has been possible to re-optimise the amount of capital and labour used, *ie* the least-cost combination of factors is used.

In the short-run, assume that the level of capital is fixed. Each short-run average cost curve shows the average cost for a different level of capital. (Therefore moving *along* a short-run average cost curve represents a change in the level of the variable factor of production, labour, only.)

Suppose a company wishes to produce an output level of Q_1. Call the optimal (long-run) level of capital needed to produce this level K_1. $SRAC_1$ is the short-run average cost when the level of capital is K_1. Moving away from Q_1 in either direction, short-run average costs are above long-run average costs.

For example, suppose the company wants to increase output to Q_2. In the short-run, it can only increase the level of labour (since the level of capital is fixed). This represents a move along $SRAC_1$ to point A.

In the long run, the company can re-optimise labour and it can also re-optimise the level of capital available to K_2, and so move to point B on to $SRAC_2$ (the short-run average cost when the level of capital is K_2).

Average cost will therefore fall to the point B, *ie* the ability to re-optimise both factors results in a lower average cost.

5   Revenue

5.1   What's included in this section

- Total, average and marginal revenue

- Revenue curves when price is not affected by the firm's output

- Revenue curves when price varies with output

- Shifts in revenue curves

5.2   Guidance

While there were 'standard' cost curves that did not depend on the type of market structure in question, revenue curves depend on the market structure of the industry, and in particular, whether price varies with output. (Market structures are discussed in the following two modules.) This means that it is important to think carefully before starting to draw the revenue curves to ensure that the revenue curves drawn fit the details of the situation given.

The 'Looking at the Maths' box contains a useful result: when the firm's demand (*ie AR*) curve is a downward-sloping, straight-line demand curve, the *MR* curve will also be downward-sloping and will have a gradient that is twice as steep. This is an important relationship to illustrate when drawing diagrams.

Another useful result is the relationship between elasticity and revenue for a firm with a downward-sloping demand curve:

- if demand is *elastic*, then lowering price will result in a larger percentage increase in sales, so that total revenue (= price $\times$ quantity) is *increased*

- if demand is *inelastic*, then lowering price will result in a smaller percentage increase in sales, so that total revenue *falls*.

5.3   Reading

Task	$\sqrt{}$*when completed*
Read Chapter 6, pages 176–180.	☐

5.4   Checklist

Task	√**when completed**
Ensure that you can:	
• define the following key terms	
– total revenue (*TR*)	☐
– average revenue (*AR*)	☐
– marginal revenue (*MR*)	☐
– price taker (and price maker)	☐
• draw typical *TR*, *AR* and *MR* curves for both a price taker and a firm with a downward-sloping, straight-line demand curve	☐
• explain the relationship between elasticity and revenue for a firm with a downward-sloping, straight-line demand curve.	☐

5.5   Questions

Question

A monopolist can sell 25 units of output per day for a price of £11.50 each and 26 units of output per day for a price of £11.25 each. The marginal revenue earned from the 26th unit sold is:

A   £11.50
B   £11.25
C   £5
D   £0.25

Solution

Option C.

Total revenue at 25 units of output is $25 \times £11.50 = £287.50$.

Total revenue at 26 units of output is $26 \times £11.25 = £292.50$.

So the marginal revenue of the 26th unit of output is £5.

Question

If labour is a variable factor, and capital a fixed factor, which of the following statements describes the law of diminishing returns?

I   The relative shortage of capital will eventually cause increases in total product to become progressively smaller.

II   The cost of the product will eventually rise as increasingly scarce labour forces the wage rate upwards.

III   The marginal revenue obtained from each additional unit produced will decline.

A   I and II
B   II and III
C   I only
D   III only

Solution

Option C.

The *law of diminishing marginal returns* suggests that as successive units of a variable factor such as a labour are combined with a fixed quantity of a fixed factor such as capital, then the increments in total output will eventually decrease. This corresponds to the scenario outlined in Statement I.

The law of diminishing marginal returns means that the cost of production is likely to increase, but not due to a rise in wages arising from scarcity of labour as wages are assumed constant. So Statement II is incorrect. Also, whether the marginal revenue obtained from each additional unit produced declines or not depends upon demand conditions and is independent of production costs. So Statement III is incorrect.

6   Profit maximisation

6.1   What's included in this section

- Short-run profit maximisation: using total curves

- Short-run profit maximisation: using average and marginal curves

- Some qualifications

6.2   Guidance

This section gives two alternative ways of finding the profit-maximising output level: calculating total profit (as total revenue minus total cost, ie $T\Pi = TR - TC$) at different output levels; and equating MR to MC. Usually questions do not specify which method to use, and – while in some situations one method is easier than the other – it is sometimes a matter of personal preference.

Box 6.10 (about using calculus) may be useful for *understanding* how an equation for profit can be differentiated with respect to quantity to give the profit-maximising level of output.

6.3   Reading

Task	√*when completed*
Read Chapter 6, pages 180–186.	☐

6.4   Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– profit-maximising rule	☐
– normal profit	☐
– supernormal profit (or pure profit, economic profit or profit)	☐
– short-run and long-run shut-down points	☐
• determine the profit-maximising output level and corresponding profit using $T\Pi = TR - TC$ and $MR = MC$ and draw diagrams illustrating each	☐
• state the two components of normal profit (%)	☐
• draw a diagram to illustrate the loss-minimising output	☐
• explain how a firm decides whether or not to produce in the short run and the long run	☐
• draw a diagram to show the short-run shut-down point.	☐

6.5   Questions

Question

Which of the following best describes the economic concept of normal profit?

A   the level of profit a firm makes by setting marginal cost equal to marginal revenue
B   the level of profit that firms would tend to make under normal conditions of trade
C   the level of profit needed to persuade a firm to stay in its current business in the long run
D   the level of profit made by a typical firm in an industry

Solution

Option C.

Normal profit is defined as the opportunity cost of being in business. It therefore represents the level of profit needed to persuade a firm to stay in its current business, rather than to leave the current industry and produce elsewhere. So Option C is correct.

Equating marginal cost and marginal revenue gives the profit-maximising output, which could correspond to a level of profits greater or less than normal profits. So Option A is incorrect.

Both the level of profits that firms would tend to make under normal conditions of trade and the level of profits made by a typical firm in an industry will depend upon many factors including the structure of the industry. So Options B and D are incorrect.

Question

Mrs E C Mist runs a bookshop. In the last year her accountant calculated Mrs Mist's profit by comparing her revenue with her expenditure on staff wages, depreciation, overdraft interest, rent, and the cost of the books sold. The resulting figure was $60,000 which her accountant calls 'profit'. Her accountant congratulates Mrs Mist on running such a profitable business.

However, Mrs Mist sees things slightly differently. She estimates that:

- she could have earned $58,000 as a pensions actuary if she had not been running the bookshop

- the $30,000 of her own money that she put into the business would have earned $2,500 in interest if she had left it in her bank account. (Arguably, we should really consider the investment return that would have been earned on an investment with a similar level of risk to the book shop.)

(i)   State which costs are (a) explicit and (b) implicit.

(ii)   State Mrs Mist's normal profit.

(iii)   Determine the economic profit that Mrs Mist made last year.

(iv)   Assuming she can sell the bookshop business for $30,000, state what your answer suggests Mrs Mist should do next year.

In the next year, Mrs Mist again runs the bookshop and her accountant calculates the accounting profits as being $80,000.

(v)   Assuming that her actuarial salary would have been $63,000 and her initial $30,000 investment in the business would have earned $2,800. Suggest how Mrs Mist will view this.

Solution

(i)(a)   Staff wages, overdraft interest, rent and the costs of the books sold.

(i)(b)   Depreciation and the opportunity cost of Mrs Mist's time and money.

(ii)   This is the profit Mrs Mist needs to make to prevent her from closing down in the long run. It is the opportunity cost of her time and money, *ie*:

$58,000 + $2,500 = $60,500

(iii)   Treating normal profit as a cost, Mrs Mist made an economic profit of:

$60,000 – $58,000 – $2,500 = –$500

ie an economic *loss* of $500.

(iv)   Assuming that the numbers remain similar next year, the loss of $500 figure suggests that she should sell the bookshop for $30,000, take a job as a pensions actuary (earning $58,000) and put the $30,000 in the bank (earning $2,500). This would earn her $500 more than keeping the bookshop.

(v)   Mrs Mist's Accounts – Year 2

	$
Accounting profit	80,000
less opportunity cost of Mrs Mist's time (*ie* potential actuarial salary)	(63,000)
less opportunity cost of Mrs Mist's money (*ie* interest earnings foregone)	(2,800)
Economic profit	14,200

Mrs Mist is a great deal happier about this year's results.

Question

(i)   Complete the following table to show the total revenue, profit, marginal revenue and marginal cost.

Output	Price	Total revenue	Total cost	Profit	Marginal revenue	Marginal cost
0	–		10.00			
1	9.95		11.00			
2	9.80		11.51			
3	9.54		12.41			
4	9.17		14.00			
5	8.66		16.46			
6	8.00		19.91			
7	7.14		24.44			
8	6.00		30.12			
9	4.36		37.00			
10	0.00		45.13			

(ii)   Show how the marginal revenue of +$1.98 when the 7th unit is sold can be explained in terms of two effects.

(iii)   Using marginal revenue and marginal cost, explain why producing six units of output maximises profit.

Solution

(i)   ***Table of calculations***

Remember that:

$$TR = P \times Q \qquad\qquad T\Pi = TR - TC$$

$$MR = \frac{\Delta TR}{\Delta Q} \qquad\qquad MC = \frac{\Delta TC}{\Delta Q}$$

Output	Price	Total revenue	Total cost	Profit	Marginal revenue	Marginal cost
0	–	0.00	10.00	−10.00		
					+9.95	+1.00
1	9.95	9.95	11.00	−1.05		
					+9.65	+0.51
2	9.80	19.60	11.51	8.09		
					+9.02	+0.90
3	9.54	28.62	12.41	16.21		
					+8.06	+1.59
4	9.17	36.68	14.00	22.68		
					+6.62	+2.46
5	8.66	43.30	16.46	26.84		
					+4.70	+3.45
6	8.00	48.00	19.91	28.09		
					+1.98	+4.53
7	7.14	49.98	24.44	25.54		
					−1.98	+5.68
8	6.00	48.00	30.12	17.88		
					−8.76	+6.88
9	4.36	39.24	37.00	2.24		
					−39.24	+8.13
10	0.00	0.00	45.13	-45.13		

(ii)   *Marginal revenue figure of $1.98*

To sell the seventh unit, a price of $7.14 is charged for all seven units. This means that $0.86 (*ie* $8.00 − $7.14) needs to be taken off the revenue from each of the previous six units. So, the *MR* is:

$$\$7.14 - (6 \times \$0.86) = +\$1.98$$

(iii)   *Why producing six units of output maximises profit*

For output of up to six, marginal revenue is greater than marginal cost, so profit increases by producing the additional unit of output. The 7th unit adds more to costs than to revenue and so reduces profit.

Question

Explain which output level on the diagram is the profit-maximising output level.
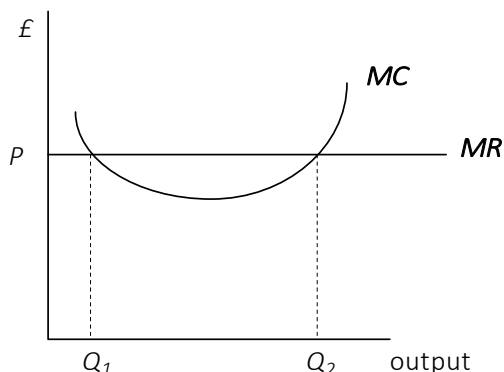
Solution

Recall that the profit-maximising level of output occurs where MC = MR. This gives two possibilities, at outputs Q_1 and Q_2.

Consider Q_1: starting at Q_1, if we increase output, marginal revenue will exceed marginal cost. Thus profits are higher immediately to the right of Q_1 than at Q_1 itself. Starting again at Q_1, if we reduce output the *lost* marginal revenue is less than the *saved* marginal cost, so profits are higher to the left of Q_1. So Q_1 is a *minimum* profit output.

Above Q_2, marginal cost exceeds marginal revenue, so profits fall as we move to the right of Q_2. To the left of Q_2, a reduction in output loses more revenue than the reduction in output saves in costs. So Q_2 is a *maximum* profit output.

Question

Which of the following situations will lead to the closure of a profit-maximising firm in the short run?

I   total revenue is less than total variable cost
II   total cost is greater than total revenue
III   fixed costs are greater than total revenue

A   I and II
B   II and III
C   I only
D   III only

Solution

Option C.

A profit-maximising firm will continue to produce output in the short run provided that it is covering its variable costs and making some contribution to its fixed costs. This is because it would have to pay the fixed costs in the short run even if it did shut down. In the short run, the firm will therefore close down only if its total revenue is less than its total variable cost.

Note that total cost being greater than total revenue (Statement II) is the condition for shutting down (*ie* exiting the industry) in the long run.

Question

Which of the following statements is/are TRUE?

I   Whether marginal revenue falls or rises with output depends upon the balance of the gain from selling extra units against the loss from reducing the selling price of existing units.

II   Whether marginal cost increases or decreases with output depends upon the balance of the gain from the further spreading of fixed costs against the loss from increasing capacity constraints.

III   Whether profits increase as output *falls* depends upon the balance between the gain from a positive level of marginal costs against the loss from a positive level of marginal revenue.

A   I and II
B   II and III
C   I only
D   III only

Solution

Option D.

Reducing output by one unit will increase profit so long as marginal cost exceeds marginal revenue, so the cost saving from producing one fewer unit is greater than the reduction in revenue. So Statement III is correct.

The balance of the gain from selling extra units against the loss from reducing the selling price of existing units determines whether marginal revenue is positive or negative and not whether it is falling or rising. So Statement I is incorrect.

Whether marginal cost increases or decreases with output depends upon whether production is taking place under increasing or diminishing returns to labour. By definition, fixed costs do not vary with output and so cannot influence marginal cost. So Statement II is incorrect.

The practice questions start on the next page so that you can
keep the practice questions and solutions together for revision purposes.

Module 6 Practice Questions

6.1 A firm's total fixed costs are $1,200. If at a certain output level, its average costs per unit are $12 and the average variable cost per unit is $8, then the level of output is:

Exam style

A   100 units.

B   150 units.

C   300 units.

D   600 units.   [1½]

6.2 (i)   Define the terms 'marginal physical product of labour' (MPP_L) and 'average physical product of labour' (APP_L).   [2]

Exam style

(ii)   Draw diagrams to illustrate the relationship between MPP_L, APP_L and total physical product of labour (TPP_L).   [3]

[Total 5]

6.3 The short-run marginal cost curve will eventually slope upwards because of the law of:

Exam style

A   diminishing marginal utility.

B   diminishing marginal returns.

C   increasing marginal utility.

D   increasing marginal returns.   [1½]

6.4 If $MC > AC$:

Exam style

A AC is rising faster than MC.

B AC is falling slower than MC.

C AC is falling.

D   AC is rising.   [1½]

6.5 Decreasing returns to scale occur when:

Exam style

A   short-run marginal cost exceeds short-run average cost.

B   short-run average cost exceeds short-run marginal cost.

C   long-run marginal cost exceeds long-run average cost.

D   long-run average cost exceeds long-run marginal cost.   [1½]

6.6 Diminishing marginal productivity:

Exam style

A   suggests that the marginal product of labour must eventually become negative.

B   is relevant in both the long run and the short run.

C   suggests that doubling both labour and capital inputs will lead a less than proportionate increase in output.

D   suggests that adding additional workers to fixed capital inputs will lead to smaller increases in output.   [1½]

6.7   (a)   Describe how the marginal physical product of labour varies with the employment of labour.

        (b)   Describe the relationship between the marginal physical product of labour curve and the marginal cost curve.

6.8   Define and describe six main sources of plant economies of scale.

6.9   You are given the following data on a firm:

Exam style

Output	Marginal cost of the next unit	Marginal revenue from the next unit	Average cost	Average revenue
5	£14	£23	£26	£35
6	£10	£19	£24	£33
7	£6	£15	£22	£31
8	£29	£11	£20	£29
9	£41	£7	£21	£27

What is the supernormal profit at the profit-maximising output?

A   £45
B   £54
C   £63
D   £72   [1½]

6.10   Consider the following data for a profit-maximising firm producing Good X in the short run.

Exam style

Output per week	Total cost (£s)	Total revenue (£s)
0	30	0
1	40	50
2	46	70
3	48	84
4	50	94
5	60	100
6	72	102

        (i)   Construct a table showing the total variable cost and marginal revenue at each level of output.   [2]

        (ii)   Calculate the profit-maximising price and output for the firm.   [2]
                                                                                                        [Total 4]

6.11   (i)   Draw a diagram to illustrate the firm's long-run output decision. Your diagram should

Exam style   include the following features: a downward-sloping marginal revenue curve, a long-run
                    marginal cost curve, and a long-run average cost curve. You should mark the exit price on
                    the diagram.   [2]

        (ii)   Explain why the marginal cost curve cuts through the bottom of the average cost curve. [2]
                                                                                                 [Total 4]

The solutions start on the next page so that you can
separate the questions and solutions.

ABC Module 6 Solutions

6.1   Option C. If the total average cost is $12 and the average variable cost is $8, then the average fixed cost must be $4. Given that total fixed costs are $1,200, the number of units produced must be:

$$\frac{\$1200}{\$4} = 300$$

[1½]

6.2   (i)   ***Marginal physical product of labour and average physical product of labour***

The *marginal physical product of labour* (MPP_L) is the increase in total output obtained by employing one extra unit of labour, keeping all other inputs constant, *ie* we are treating labour as the variable factor with other factors such as capital held fixed.   [1]

The *average physical product of labour* is:

$$APP_L = \frac{\text{total output}}{\text{total number of units of labour}}$$

[1]

(ii)   ***Relationships between MPP_L , APP_L and TPP_L***
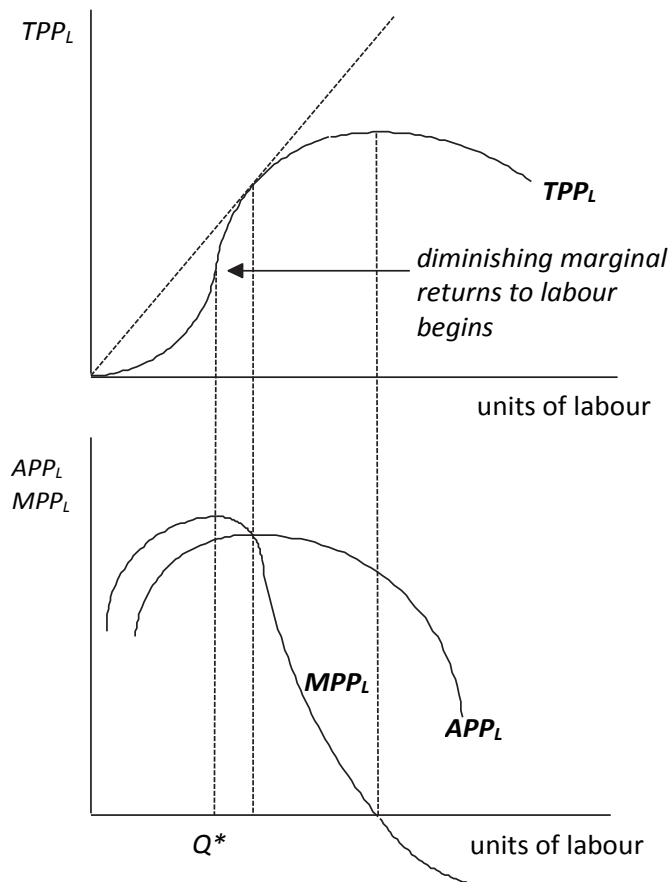
[1½ for each correct diagram, total 3]

The shape of the MPP_L curve is drawn assuming that the law of diminishing returns applies, ie assuming at first increasing returns to labour (up to Q*) and ultimately diminishing returns to labour (beyond Q*).

Notice in the diagram above that the MPP_L curve cuts the APP_L curve at its maximum point. This can easily be explained. If the additional worker adds more to the total than the average (eg $MPP_L = 7$, $APP_L = 5$), this will pull up the average. If the additional worker adds the same to the total as is the average (eg $MPP_L = 6$, $APP_L = 6$), then the average will stay the same. If the additional worker adds less to the total than the average (eg $MPP_L = 4$, $APP_L = 6$), this will pull the average down.

6.3   Option B. It is the marginal returns to a variable factor of production that will determine the shape of the marginal cost curve in the short run. As successive units of the variable factor of production are added to a fixed quantity of the fixed factors of production, the law of diminishing marginal returns says that, after a certain level of output, each extra unit of the variable factor will add less to total production than the previous unit. If each unit costs the same to employ, then marginal costs will start to rise.   [1½]
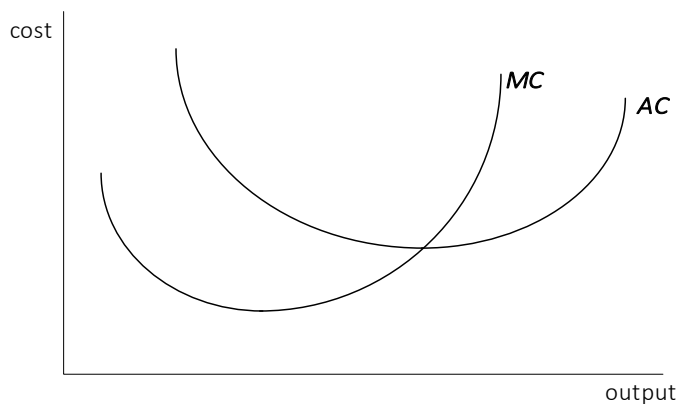
6.4   Option D. *AC* will be rising if, and only if, *MC* > *AC*. This is because *MC* is, in effect, pulling up the *AC*. *AC* will not rise faster than *MC*.   [1½]

Recall the diagram showing the typical relationship between the MC and AC curves.

6.5   Option C. When a firm experiences decreasing returns to scale, its long-run average cost (*LRAC*) curve slopes upwards (assuming that factor prices are constant). As the long-run marginal cost curve cuts the *LRAC* curve at the minimum point on the *LRAC* curve, long-run marginal cost must exceed long-run average cost.   [1½]

*Remember that returns to scale is a **long-run** phenomenon.*

6.6   Option D. Diminishing marginal productivity suggests that the marginal product of labour *may* eventually become negative, but not that it must necessarily do so. It is relevant only in the short run, when capital is assumed to be fixed, as it assumes that additional units of labour are added to a *fixed* amount of capital. It occurs when each additional worker adds less to output than the previous worker, with capital being fixed.   [1½]

6.7   (a)   ***How marginal physical product of labour curve varies with labour***

As more units of labour are employed, the marginal physical product of labour may increase at first ...

... but tends eventually to fall due to the law of diminishing marginal productivity.

(b)   ***Relationship between the marginal physical product of labour curve and the marginal cost curve***

Assuming that the wage rate is constant:

- when the marginal physical product of labour curve is increasing (so fewer additional units of labour are needed to produce each extra unit of output), the marginal cost curve is decreasing

- when the marginal physical product of labour curve is decreasing (so more additional units of labour are needed to produce each extra unit of output), the marginal cost curve is increasing.

6.8   *Economies of scale* arise when long-run average costs decrease as output rises.

Plant economies of scale are economies of scale that arise specifically because of the large size of the production facility.

Plant economies of scale can arise from a number of sources:

- *Specialisation*: The division of labour allows people to become experts at small parts of the production process, thus increasing output per person. Similarly, more specialist machines can be employed as output rises.

- *Indivisibilities*: Some pieces of equipment and some processes such as research must be of a certain minimum size. Thus efficiency increases as the output approaches the optimum for this equipment and these processes.

- *The container principle*: The cost of producing storage containers might increase with surface area, while output increases with volume. So, as volume increases with size more rapidly than surface area, average costs will tend to decrease with higher output.

- *The greater efficiency of large machines*: Large machinery may be more efficient to use than small machinery in combination with other factor inputs, *eg* labour and raw materials. For example, one worker might be needed to operate a small or a large machine.

- *By-products*: Large scale production may generate sufficient quantities of waste to produce by-products, *eg* heat, which can be sold commercially.

- *Multi-stage production*: Combining different stages of production within a single factory may reduce overall average production costs, *eg* due to reduced transportation costs.

6.9   D. The profit-maximising firm will increase output as long as the extra revenue from selling the next unit is greater than (or equal to) the extra cost incurred in producing it. This firm will therefore produce eight units. The supernormal profit is then:

quantity × (average revenue – average cost) = 8 × (29 – 20) = 72   [1½]

*Notice that the MC and the MR refer to the **next** unit.*

6.10   (i)   ***Table of TVC and MR***

Output	Total variable cost (£s)	Marginal revenue from last unit (£s)
0	0	0
1	10	50
2	16	20
3	18	14
4	20	10
5	30	6
6	42	2

[2 for the table correctly set out.]

Total variable cost = total cost – fixed cost of £30.

MR of the nth unit = total revenue from n units – total revenue from $n-1$ units.

(ii)   ***Profit-maximising price and output***

Profit is maximised where the difference between total revenue and total cost is greatest and so we can get this directly from the table in the question. The profit-maximising output is 4 units (when profit is equal to 94 – 50 = 44).   [1]

Alternatively, we could derive the marginal costs from the total variable costs in the table in part (i) above, and so determine the profit-maximising output at 4 units, since beyond 4 units, MR < MC.

Output	Marginal cost (£s)	Marginal revenue (£s)
0		
1	10	50
2	6	20
3	2	14
4	2	10
5	10	6
6	12	2

Profit-maximising price = profit-maximising average revenue = 94/4 = £23.50.   [1]

[Total 2]

6.11   (i)   *The long-run output decision*
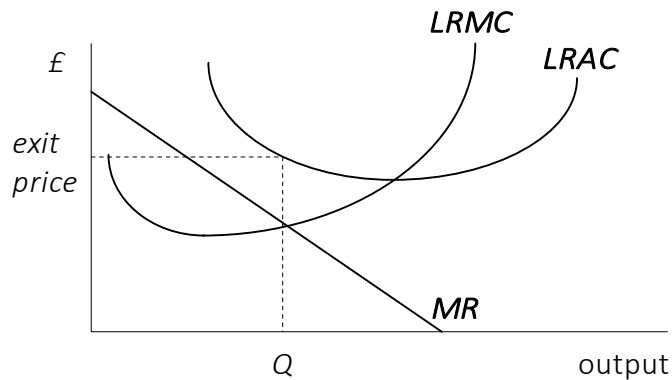
[2]

LRMC cuts LRAC at the lowest point on LRAC. So long as this is correct the diagram should be acceptable whatever the position of the LRAC curve.

Where LRMC crosses MR determines the profit-maximising level of output, Q. The exit price is the point on LRAC corresponding to this output level. For prices below the exit price, the firm should leave the industry.

(ii)   *The relationship between average and marginal cost*

If, at current production, the marginal cost of producing an additional unit is less than the average cost (*eg* the average cost of making 5 units is £10, but the marginal cost of a 6th unit is £4), then the average cost will fall (to £9) if output is increased.   [½]

If the marginal cost of producing an additional unit is equal to the average cost (*eg* if the marginal cost of a 7th unit is £9), then the average cost will remain constant (at £9) if output is increased.

[½]

If the marginal cost of producing an additional unit is greater than the average cost (*eg* if the marginal cost of an 8th unit is £17), then the average cost will rise (to £10) if output is increased.

[½]

So, whenever $MC < AC$, AC must be falling, and whenever $MC > AC$, AC must be rising. Therefore MC must cut AC at its minimum point.   [½]

[Total 2]

7

Perfect competition and monopoly

Syllabus objectives

2.5   Discuss profit maximisation under perfect competition and monopoly.

1.   Explain what determines the market power of a firm.

2.   Describe the main features of a market characterised by perfect competition.

3.   Explain how output and price are determined in such markets in the short and long run.

4.   Describe how monopolies emerge, how a monopolist selects its profit-maximising price and output and how much profit a monopolist makes.

5.   Describe the barriers to entry in an industry and a contestable market and explain how these affect a monopolist's profit.

Core Reading

Chapter 7   *Pages 189–216*

0   Introduction

This module and the one that follows apply the concepts developed in the previous module to firms operating in different types of market.

In this module, we look at the two extremes – the case where there are effectively infinitely many firms, and the case where there is only one firm. The next module considers intermediate cases.

The concept of the *optimal* output level is introduced here and this is also covered in Module 10 on market failure.

1   Alternative market structures

1.1   What's included in this section

- Alternative market structures

1.2   Guidance

This short section introduces the four market structures and considers some of their basic characteristics. Their characteristics will be covered in more detail in later sections, so it should be possible to work through this material quickly to gain a basic overview of what's to come.

However, the 'Examples' in Table 7.1 are a particularly useful part of this section. The finer details of, say, monopolistic competition, might be hard to remember at this stage, but it should be fairly easy to picture the restaurant industry and consider some of its characteristics in practice. Furthermore, the examples are sometimes required in answers to exam questions.

Box 7.1 is also useful for setting the scene. It discusses the use of n-firm concentration ratios (the percentage of the market held by the largest n firms) as an indicator of the competitiveness of an industry.

1.3   Reading

Task	*√when completed*
Read Chapter 7, pages 190–191.	☐

1.4   Checklist

Task	*√when completed*
Ensure that you can:	
• define and describe the four types of market structure, namely:	
– perfect competition	☐
– monopolistic competition	☐
– oligopoly	☐
– monopoly	☐
• define the following key term:	
– imperfect competition	☐
• explain the factors that determine the firm's degree of control over price, *ie* its market power.	☐

1.5   Questions

Question

Imperfect competition is the collective name for:

A   perfect competition and monopolistic competition.
B   perfect competition and monopoly.
C   oligopoly and monopoly.
D   oligopoly and monopolistic competition.

Solution

Option D. Imperfect competition is the collective name for monopolistic competition and oligopoly (by definition).

Question

Match the following characteristics to the corresponding market structure:

Market structure	*Characteristic*
Perfect competition	each firm has a small degree of control over price
Monopolistic competition	there is only one firm
Oligopoly	firms in the industry enjoy the benefits of barriers to entry
Monopoly	there is freedom of entry into the industry and all firms produce an identical product

Solution

Market structure	*Characteristic*
Perfect competition	there is freedom of entry into the industry and all firms produce an identical product
Monopolistic competition	each firm has a small degree of control over price
Oligopoly	firms in the industry enjoy the benefits of barriers to entry
Monopoly	there is only one firm

*Note that the word 'firm**s**' in the oligopoly characteristic is plural, which is why this is not a characteristic of monopoly.*

Question

Complete the following table, which summarises the main features of the four different market structures.

	Perfect competition	Monopolistic competition	Oligopoly	Monopoly
No. of firms	very many			
Ability to affect price		limited		
Entry barriers			some	

Solution

	Perfect competition	Monopolistic competition	Oligopoly	Monopoly
No. of firms	very many	many	few	One
Ability to affect price	none	limited	some	considerable
Entry barriers	none	none	some	complete

Question

Give four examples of firms that could be classed as monopolistically competitive.

Solution

Examples of monopolistically competitive firms:

- builders, electricians, plumbers

- cafes, pubs, restaurants

- newsagents, gift shops

- garage mechanics

- hairdressers.

Question

Explain how the variety of products produced by an industry affects the degree of market power enjoyed by a firm.

Solution

Market power is the extent to which the firm can control price.

This depends on the elasticity of demand for the product, which depends on the degree to which the consumer can find a substitute for the product.

In perfect competition:

•   the products are identical

•   consumers have perfect knowledge and behave rationally, so will always buy the cheapest good.

Hence in perfect competition, demand is perfectly elastic, *ie* firms have no market power.

In other market structures, firms may have a degree of market power. This will depend on:

•   the extent to which the product of one firm is differentiated from the products of other firms

•   the degree of brand loyalty for the product.

The more differentiated the product and the greater the brand loyalty, the more inelastic the demand for the good, and the greater the market power of the producer.

2   Perfect competition

2.1   What's included in this section

- Assumptions of perfect competition

- The short run and the long run

- The short-run equilibrium of the firm

- The long-run equilibrium of the firm

- The incompatibility of perfect competition and substantial economies of scale

- Perfect competition and the public interest

2.2   Guidance

This material (along with the other sections in this module) have been frequently examined in Subject CT7 (and its predecessors), usually as multiple-choice and short-answer questions, although long-answer questions have also appeared from time to time.

Box 7.3 is a nice practical discussion of the extent to which the assumptions of perfect competition are fulfilled by e-commerce, and also the concerns that e-commerce might actually *reduce* competition.

The examination will probably test a *knowledge* of the features of perfect competition, an *ability to draw* the equilibrium diagrams for the short run and the long run, an *ability to analyse* the effect of changes in cost or revenue on the equilibrium position of the firms and the industry, and an *ability to evaluate* perfect competition and to *compare* it with other market structures.

Diagrams are a common requirement of short-answer questions. Furthermore, when answering multiple-choice questions, it is often worth sketching a diagram to ensure the answer makes sense. It is therefore essential to be able to draw diagrams illustrating perfect competition efficiently and accurately.

If asked to draw equilibrium diagrams for any market structure, the following steps will be useful to ensure that the diagram turns out as it should:

1.   Draw the demand curve ($D = AR$). For perfect competition, each firm faces a *horizontal* demand curve at price P^*.

2.   Draw the marginal revenue curve (MR). For perfect competition, it is the same as the demand curve.

3.   Draw in the usual 'J-shaped' marginal cost curve (MC).

4.   Find the profit-maximising output by choosing the output level Q^* where MC equals MR.

5.   Find the price that can be charged for this level of output. The demand curve (AR) tells us the price. For perfect competition, the price is fixed by the market supply and demand curves. P^* is the price that must be charged.

6.   Draw the 'U-shaped' average cost curve (*AC*) so that the marginal cost cuts through the minimum point on the average cost curve. The vertical position of the average cost curve will depend on whether we want to show the firm earning normal profit, supernormal profit or losses.

In the short run, all three positions are possible:

- If *AR* > *AC*, then supernormal profit is being earned.

- If *AR* = *AC*, then normal profit is being earned.

- If *AR* < *AC*, then losses are being made. In the short run the firm will shut down if the price is less than the *AVC*.

In the long run, perfectly competitive firms will make normal profits due to the absence of barriers to entry.

7.   Find the average cost of making *Q**. Mark it on the diagram as *AC**.

8.   Find the level of profit. If price exceeds average cost, then the firm is making supernormal profit per unit of $P*-AC*$. Total supernormal profit is then $(P*-AC*) \times Q*$.

Remember that *cost curves* have the *same* basic shape regardless of the market structure, but a firm's *revenue curves depend* crucially on its market power.

Note that in the previous module, the 'short run' and the 'long run' were defined in terms of fixed and variable factors of production, however in this module, these terms are specified in a slightly different (but related) way, *ie* in terms of the period of time that is long enough for new firms to enter the industry or existing firms to leave.

2.3   Reading

Task	√*when completed*
Read *Chapter 7*, pages 191–201.	☐

2.4   Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– short run and long run under perfect competition	☐
– rate of profit	☐
– increasing-cost industry	☐
– constant-cost industry	☐
– decreasing-cost industry	☐
– consumer sovereignty.	☐

Task	√*when completed*
Continued Ensure that you can:	
• state the four assumptions under perfect competition	☐
• sketch industry supply and demand curves for perfect competition	☐
• sketch the firm's cost and revenue curves for perfect competition	☐
• explain and illustrate how perfectly competitive firms determine the equilibrium price and output in the short run and the long run	☐
• explain and illustrate the derivation of the short-run supply curve for the firm and the three possible long-run supply curve for the industry	☐
• describe why perfect competition is incompatible with substantial economies of scale	☐
• explain why producing where price equals marginal cost is regarded as an optimal (or allocatively efficient) position	☐
• discuss the extent to which perfectly competitive firms are productively efficient	☐
• outline the benefits and possible disadvantages of perfect competition for society.	☐

2.5 Questions

Question

Which of the following is NOT an assumption underlying perfect competition?

A   There is a large number of firms in the industry.
B   The industry demand curve is horizontal.
C   Buyers have perfect information.
D   Firms are free to enter or leave the industry.

Solution

Option B. Options A, C and D are three of the assumptions underlying perfect competition. In perfect competition, it is the *individual firm's* demand curve that is horizontal. The *industry* demand curve is a normal *downward-sloping* demand curve.

Question

The short-run industry supply curve in a perfectly competitive market is the:

A   vertical sum of the individual firms' average variable cost curves.

B   horizontal sum of the individual firms' average variable cost curves.

C   vertical sum of the individual firms' marginal cost curves.

D   horizontal sum of the individual firms' marginal cost curves.

Solution

Option D. The short-run supply curve in the market for a good is the total quantity supplied at each price level. In the short run, each firm in a perfectly competitive market will produce at a level of output where $P = MR = MC$, as long as the price it receives is sufficient to at least cover its short-run average variable costs. Therefore for each individual firm, the MC curve above the minimum average variable cost represents its short-run supply curve and to find the industry short-run supply curve, we need the horizontal sum of the MC curves from above the point where they cut the respective AVC curves.

Question

'Firms in a perfectly competitive market make no profits.'

Discuss this assertion.

Solution

The assertion is false.

Perfectly competitive firms make zero *supernormal* (or *economic*) profits in the *long run*.

This is because free entry / exit of firms into and out of the industry in the long run ensures that:

- loss-making firms will go out of business, reducing overall levels of supply

- the existence of supernormal (or economic) profits will attract new entrants, thereby increasing supply.

Thus price in such an industry will always return to the critical point where the revenue just covers the full economic costs.

The full economic cost includes the opportunity cost of being in business, *ie* the opportunity cost of the owners' time and resources, so firms make *normal* profits.

However, after a shock, *eg* a change in demand for the product, the industry may be out of long-run equilibrium, therefore all firms may make supernormal (or economic) profits (or losses) in the short run.

Question

For a perfectly competitive industry, state the likely effect in the long run on:

(a)   the industry's supply

(b)   the market price

(c)   the level of profit earned by firms

of:

(i)   new firms entering the industry in the long run, attracted by supernormal profit

(ii)   firms making losses in the short run.

Solution

(i)   ***New firms entering the industry in the long run***

(a)   The industry's supply would increase.

(b)   The market price would fall.

(c)   The level of profit earned by firms would fall until normal profit is being made.

(ii)   ***Firms making losses in the short run***

(a)   The industry's supply would decrease due to firms leaving the industry.

(b)   The market price would rise.

(c)   The level of profit earned by firms would rise until normal profit is being made.

Question

Explain why under perfect competition the price charged to customers is equal to the marginal cost.

Solution

Firms maximise profits by setting $MR = MC$. Under perfect competition the firm's demand curve is horizontal, therefore $P = MR$. Thus we have $P = MC$.

3   Monopoly

3.1   What's included in this section

- What is a monopoly?

- Barriers to entry

- Equilibrium price and output

- Monopoly and the public interest

3.2   Guidance

The examination will probably test a *knowledge* of the features of monopoly, an *ability to draw* the equilibrium diagrams for the short run and the long run, an *ability to analyse* the effect of changes in cost or revenue on the equilibrium position of the firms and the industry, and an *ability to evaluate* monopoly and to *compare* it with other market structures.

As stated in the previous section, it is essential to be able to draw diagrams (in this case illustrating monopoly) efficiently and accurately.

If asked to draw equilibrium diagrams for any market structure, the following steps will be useful to ensure that the diagram turns out as it should:

1.   Draw the demand curve (*D = AR*). For monopoly it should slope downwards (and be relatively inelastic, *ie* steep).

2.   Draw the marginal revenue curve (*MR*). For monopoly, it should slope downwards and be below the demand curve. If the *D = AR* curve is a straight line, then the *MR* curve is also a straight line. It will have the same vertical intercept and be exactly twice as steep, so that it cuts the horizontal axis exactly halfway between the *AR* intercept and the origin.

3.   Draw in the usual 'J-shaped' marginal cost curve (*MC*).

4.   Find the profit-maximising output by choosing the output level *Q** where *MC* equals *MR*.

5.   Find the price that can be charged for this level of output. The demand curve (*AR*) tells us the price. For monopoly, the price will depend on the level of output. *P** is the price that must be charged.

6.   Draw the 'U-shaped' average cost curve (*AC*) so that the marginal cost cuts through the minimum point on the average cost curve. The vertical position of the average cost curve will depend on whether we want to show the firm earning normal profit, supernormal profit or losses.

       In the short run, all three positions are possible. In the long run, monopolists are likely to make supernormal profits.

7.   Find the average cost of making *Q**. Mark it on the diagram as *AC**.

8.   Find the level of profit. If price exceeds average cost, then the firm is making supernormal profit per unit of $P*-AC*$. Total supernormal profit is then $(P*-AC*) \times Q*$.

Remember that *cost curves* have the *same* basic shape regardless of the market structure, but a firm's *revenue curves depend* crucially on its market power.

Box 7.5 (*not* Box 7.4 as referred to on page 207) includes information on inefficiency that is not covered by formal definitions in this chapter of the textbook:

- X inefficiency (the inefficiency resulting from a lack of competition, which results in technical or productive inefficiency)

- allocative inefficiency (the inefficiency resulting from producing less than the optimal output, *ie* price is greater than marginal cost).

It is useful to be familiar with these concepts at this stage and to recognise that a situation of both productive efficiency (minimum cost for given output) and allocative efficiency (optimal output) will also be *economically efficient*.

Note that the subsection on limit pricing is also covered in Module 9 on pricing. Price discrimination will be discussed in detail there too.

3.3   Reading

Task	√*when completed*
Read Chapter 7, pages 201–211.	☐

3.4   Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– barrier to entry	☐
– natural monopoly	☐
– switching costs	☐
– network externalities or network economies	☐
– limit pricing	☐
– competition for corporate control	☐
• describe the main features of a monopoly	☐
• describe the barriers to entry that may exist	☐
• explain and illustrate how monopolists determine the equilibrium price and output	☐
• discuss how much profit may be made by a monopolist.	☐

Task	√*when completed*
Continued	
Ensure that you can:	
• discuss whether or not monopolists might be productively efficient (*ie* produce at minimum cost) and allocatively efficient (*ie* produce optimal output)	☐
• compare perfect competition and monopoly in terms of price and output levels	☐
• discuss the advantages and disadvantages of monopoly for the public.	☐

3.5   Questions

Question

Which one of the following is NOT a barrier to entry?

A   the cost to consumers of learning how to use a particular product
B   low minimum efficient scale
C   exploiting the benefits of large-scale production
D   obtaining control over the raw materials

Solution

Option B. In some industries, the opportunities for economies of scale are limited. Hence the minimum efficient scale is low. This means that large firms do not enjoy cost advantages and so there is room in the industry for both small and large firms, *eg* brewing.

Question

State the main features of monopoly.

Solution

The following are the main features of monopoly:

- a monopolist is a sole supplier of a product in an industry

- there will often be no potential rivals

- there are barriers to the entry of new firms into the industry

- the product is unique

- the monopolist faces the market demand curve

- the monopolist faces a downward-sloping demand curve

- the monopolist has considerable control over price

- supernormal profit can be earned in the long run

- the monopolist produces less output than the optimal level of output

- a monopoly might suffer from X inefficiency

- a monopoly might benefit from economies of scale

- a monopolist might be able to afford to invest in research and development (R&D)

- a monopoly could operate a policy of price discrimination

- monopolies are sometimes owned and run by the state.

Question

In the short run, the monopolist can make supernormal profit, normal profit or losses. State which of these three positions is/are possible in the long run.

Solution

Supernormal profit and normal profit are possible in the long run. However, the monopolist would leave the market rather than make losses in the long run.

4   The theory of contestable markets

4.1   What's included in this section

- Potential competition or monopoly?

- The importance of costless exit

- Assessment of the theory

- Contestable markets and the public interest

4.2   Guidance

This is a short section, which – historically – has been examined less than the previous two. It considers how the *threat* of competition, rather than *actual* competition, is important in influencing price and output.

Box 7.7 discusses the contestability of the airline industry and highlights the importance of deregulation (*ie* the removal or reduction of regulations) in increasing the contestability of the market.

4.3   Reading

Task	√*when completed*
Read Chapter 7, pages 211–216.	☐

4.4   Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– perfectly contestable market	☐
– hit and run	☐
• describe how the following are affected in a perfectly contestable market:	
– price and profit	☐
– efficiency	☐
• distinguish between *actual* competition and *potential* competition	☐
• discuss the importance of costless exit in perfectly contestable markets.	☐

Task	√ *when completed*
Continued Ensure that you can: • discuss the strengths and limitations of the theory of contestable markets • discuss whether contestable markets are good for the public interest both in theory and in practice.	 ☐ ☐

4.5 Questions

Question

Fill in the blanks:

Monopolies operating in perfectly _____ markets are in danger of being _____ out of the market (or being subject to a ____ and ____) by new firms. As a result, they will keep prices _____ , make _____ profits and produce as _____ as possible.

Solution

Monopolies operating in perfectly <u>CONTESTABLE</u> markets are in danger of being <u>DRIVEN</u> out of the market (or being subject to a <u>HIT</u> and <u>RUN</u>) by new firms. As a result, they will keep prices <u>DOWN</u>, make <u>NORMAL</u> profits and produce as <u>EFFICIENTLY</u> as possible.

Question

A monopolist in a perfectly contestable market will:

I   produce as efficiently as possible and only make normal profits
II   keep prices down, but produce supernormal profits
III   produce as efficiently as possible and make supernormal profits

A   I and II
B   II and III
C   I only
D   III only

Solution

Option C. According to the theory, a monopolist in a perfectly contestable market will keep prices down so that it is only making normal profits, and will produce as efficiently as possible.

Question

For each of the following, explain whether it represents a potentially contestable market.

(a)   airline routes

(b)   savings accounts

(c)   hospital catering.

Solution

(a)   *Airline routes*

For new firms entering the airline industry, there would be very high entry costs (*eg* planes) and high sunk costs, as it may be difficult to transfer its investments to other uses.

However, the low-cost carriers, *eg* Ryanair, often lease planes rather than buying them. They also have low operating costs, *eg* reducing fuel costs by charging extra for extra items of luggage, thus reducing the weight carried.

Also, regulations, *eg* licences to fly routes only issued to the national airlines, have impeded competition in the airline industry. The low-cost carriers were able to enter the market as a result of deregulation, a policy known as 'open skies'.

Also, for *existing* firms, the costs of switching to new routes should be relatively low. Similarly, the cost of switching *from* existing routes should be low (*ie* low sunk costs).

Given that airlines already exist, and could therefore switch to new routes fairly easily, potential competition exists for all airline routes (whether new or not).

Therefore airline routes are a potentially contestable market.

(b)   *Savings accounts*

The cost of offering savings products for the first time will be high as there will be high costs of investing in computer systems, an administrative infrastructure, and expertise. Furthermore, these costs will generally be sunk costs, because they will generally not be able to be transferred to other uses if the firm decided to exit the industry. In this sense, this market is not a potentially contestable market.

However, for existing lenders, the entry and exit costs of offering a *new* type of savings account should be fairly low.

Similarly, for very large service-based firms, it may be possible to start offering savings products (possibly by outsourcing the administration), and so for such firms the market may be potentially contestable.

(c)   ***Hospital catering***

The costs of setting up a catering facility may not be particularly large, so it should be relatively easy for firms to enter the market. Furthermore, it may be possible to sell on equipment if the firm left the industry, so sunk costs should also be low.

However, the firm that has the current contract with a particular hospital or group of hospitals is likely to have a local monopoly, at least in the short run. Therefore, in the short run, the market is not potentially contestable.

In the long run, if the service provided by the current firm is seen to be poor value for money and/or of poor quality, then the hospital is likely to seek a new supplier. Therefore in the long run, the market is likely to be potentially contestable.

The practice questions start on the next page so that you can
keep the practice questions and solutions together for revision purposes.

Module 7 Practice Questions

7.1 Draw the short-run equilibrium position for a perfectly competitive firm that is making losses, the losses being insufficient to make it shut down in the short run. [3]

Exam style

7.2 Suppose an industry is operating in perfect competition.

Exam style

Explain, with the aid of a diagram of a firm in this industry, the effects on both price and output in both the short run and the long run of:

(i) an increase in the fixed costs of production for the product [6]

(ii) a permanent rise in demand for the product. [6]

[Total 12]

7.3 'A company maximises profits by setting output at a level such that the marginal cost of production equals the price for which the company sells the product.'

Describe the conditions under which this statement is true.

7.4 Which of the following CANNOT be true for a profit-maximising monopolist?

Exam style

A   Profits are equal to normal profits in the long run.
B   An economic profit is made in the short run.
C   An economic loss is made in the short run.
D   Marginal revenue is negative. [1½]

7.5 (i) Draw a diagram to show the profit-maximising position for a monopolist. [3]

Exam style

(ii) Indicate on the diagram the price and output if the monopolist decides to:

(a) break even (*ie* make only normal profit)

(b) produce the optimal output. [2]

[Total 5]

7.6 'Monopolies are efficient because they make the high profits'.

Discuss this statement.

7.7 'A profit-maximising monopolist will aim to maximise total revenue if the marginal cost of the product supplied is zero at all output levels.'

Exam style

Discuss this assertion, and draw a diagram to illustrate a monopoly in this position. [5]

The solutions start on the next page so that you can
separate the questions and solutions.

ABC **Module 7 Solutions**

7.1   *Notice that the price is less than the average cost (so the firm is making a loss) but greater than the average variable cost (so the firm is covering its variable costs and some of its fixed costs).*
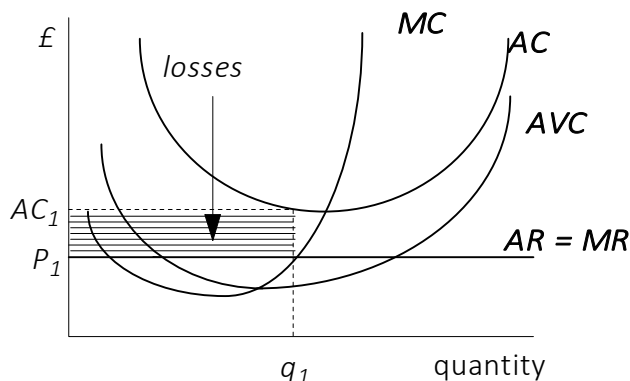
[3]

7.2   (i)   ***Increase in fixed costs of production***

[2]
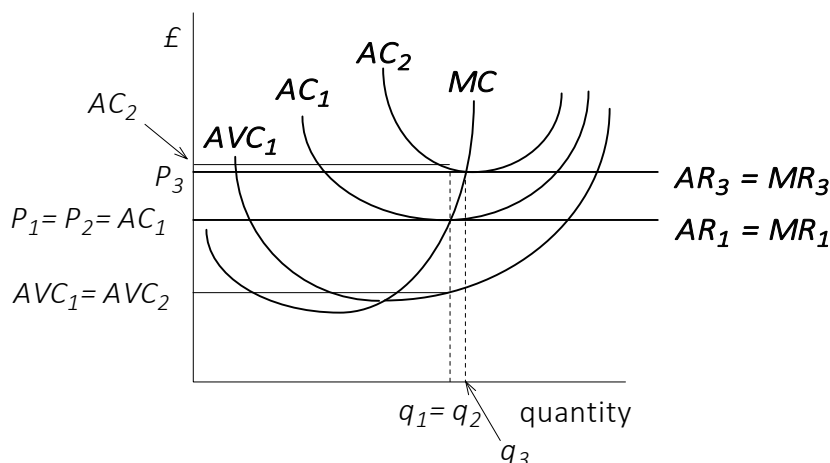
In the above diagram, AR_1 represents the original demand curve faced by an individual firm in a perfectly competitive industry. The profit-maximising firm produces where $MR = MC$, with a price of P_1 and an output level of q_1, and makes normal profits.   [½]

A rise in fixed costs does not affect the marginal cost of production (which is simply the *variable* cost of producing one more unit), nor the average variable cost, so the MC and AVC curves do not change.   [1]

However, the rise in fixed costs raises the average cost of production.   [½]

Since the marginal cost and the marginal revenue curves are unchanged the profit-maximising level of output is unchanged.   [½]

However, since the average cost curve has risen, firms are now making losses.   [½]

A firm will carry on producing in the short run provided the price covers the average variable cost, which it will since *AVC* and price have not changed.   [½]

This is assumed in the following diagram, where average cost rises from AC_1 to AC_2, but price ($P_1 = P_2$) and output ($q_1 = q_2$) remain unchanged:

In the long run, loss-making firms begin to leave the industry. As they do, the short-run supply curve of the industry shifts to the left and the market price increases.   [½]

This process continues until the price rises sufficiently to restore normal profit to the remaining firms, *ie* until the price increases to P_3.   [½]

As the price and the *MR* rise, the profit-maximising level of output rises until the new long-run equilibrium is reached at q_3.   [½]

[Maximum 6]

(ii)   ***Permanent rise in demand***

[2]
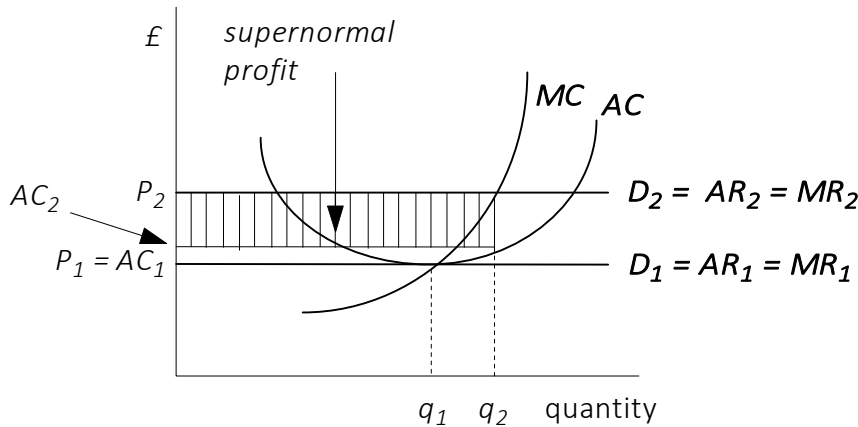
In the above diagram, D_1 represents the original demand curve faced by an individual firm in a perfectly competitive industry. The profit-maximising firm produces where $MR = MC$, with a price of P_1 and an output level of q_1, and makes normal profits (since $P_1 = AC_1$).   [½]

The market price is determined by demand and supply in the market as a whole. If demand for the good increases, then the market price will increase, say from P_1 to P_2. Firms are price takers and will therefore take this higher price as given.   [½]

The firm will increase output to q_2, where $MR_2 = MC$.   [½]

The average cost of making q_2, is AC_2. This is less than P_2, so the firm is making supernormal profits, as indicated.   [½]

In the long run, other firms will be attracted to the industry by the supernormal profits available.
[½]

As more firms enter the industry, the increase in supply will drive down prices and supernormal profits.   [½]

Assuming that all firms experience the same costs and that costs do not change as output changes, firms will continue to enter the industry until the price falls back to P_1 and normal profits are again being made.   [½]

So, the firm will reduce output back to q_1, where $MR_1 = MC$, once again. In the long run, therefore, the firm's output and its price are unchanged.   [½]
[Total 6]

7.3   *Definitions*

Marginal cost is the increase in total cost when output is expanded by one unit.

When a single price is charged, price is total revenue divided by output, *ie* average revenue.

Marginal revenue is the increase in total revenue when output is expanded by one unit.

Note that definitions often score marks, but not always. Either way, it is usually useful to include them, particularly as they often help clarify the situation.

Profit maximisation

If marginal revenue exceeds marginal cost, profits can be increased by *expanding* output. If marginal revenue is less than marginal cost, profits can be increased by *reducing* output. Thus a company maximises profits by producing at a level where marginal cost *equals* marginal revenue.

Hence the statement in the question is only true if marginal revenue equals price.

Under what conditions does marginal revenue equal price?

Marginal revenue is equal to price if the demand curve that a firm faces is horizontal (totally elastic demand).

Under perfect competition, individual firms do face a horizontal demand curve, thus the statement in the question is true for firms in perfect competition.

*The only other situation in which marginal revenue is equal to price is when the firm is practising first-degree price discrimination, ie charging each consumer the maximum price he/she is prepared to pay, because the price of each unit **will be** the marginal revenue of selling that unit. This will be studied in Module 9.*

Conditions for perfect competition

- large number of firms, or at least a potentially large number of firms
  - needed so that no one firm can have a material effect on the industry's output and thus all firms are price takers, *ie* face a horizontal demand curve

- homogeneous product
  - so that each firm's product is a perfect substitute for the other firms' products

- buyers have perfect information and access to all companies' output
  - so they know if one firm is trying to sell its goods at a price higher than other firms and that all goods are identical

- buyers act rationally
  - so a firm is unable to sell anything at a price even fractionally above the going market price because all the consumers will immediately switch to buying their goods from one of the firms who are charging the going rate
- free entry and exit of firms
  - so that firms cannot collude to restrict supply and thus increase price.

7.4   Option D. A profit-maximising monopolist will produce where $MR = MC$. If marginal revenue is negative, then marginal cost must be negative, which is impossible.   [1½]

7.5
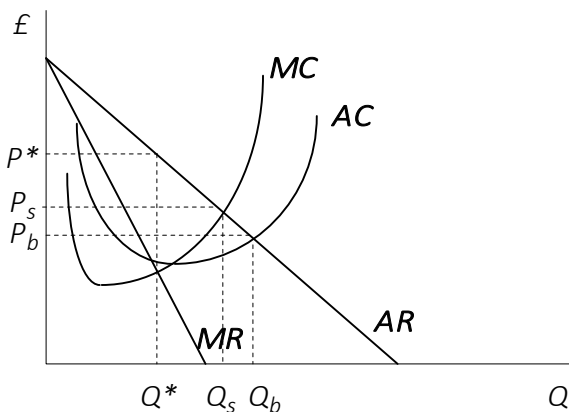
[2 for diagram]

(i)   The profit-maximising level of output is found where $MR = MC$. This gives (P^*, Q^*).   [1]

(ii)(a)   The monopolist will break even (*ie* make normal profit) where $AR = AC$. This gives (P_b, Q_b).   [1]

(ii)(b)   The optimal level of output occurs where price (AR) = MC. This gives (P_s, Q_s).   [1]

[Total 5]

7.6   *'Highest profits'*

This is referring to the fact that monopolists are able to make supernormal profits in the long run.

The question is: do these reflect efficiency or just market power?

Firms in perfect and monopolistic competition may also be able to make supernormal profits in the short run but will make only normal profits in the long run, because firms are free to enter the industry.

Thus supernormal profits are not exclusive to monopolies, but only monopolists and oligopolists can earn them in the long run, because of barriers to entry.

On the other hand, it is possible for governments to regulate monopolies to ensure a higher level of output and a lower level of profits. Therefore, not every monopoly will necessarily make supernormal profits.

'Most efficient'

Firstly, let's consider productive efficiency, *ie* the production of output at minimum cost.

Opinions on this point may vary. Some would argue that because monopolies do not face competition, there is no incentive for them to control costs and operate efficiently (*ie* they suffer from X inefficiency).

In contrast, a perfectly competitive market, in which consumers have perfect information and act rationally, will be more efficient than a monopoly market, where consumers have to accept what is offered.

However, monopolies tend to be relatively large, and as such, may benefit from economies of scale.

They may also be able to invest their supernormal profits in research and development that is focused at improving efficiency.

Furthermore, if the monopolist is inefficient, then it will also lose out, in the form of lower profits.

In addition, a monopoly may face pressure to produce efficiently and keep costs down:

- if it operates in a *contestable market* and so is subject to potential competition

- as it may be taken over if it is inefficient, *ie* is subject to *competition for corporate control*.

We also need to consider the other meaning of the word '*efficient*'. By restricting output and putting up prices, monopolies may be producing a level of output which is not *allocatively* efficient.

Society would be better off if production is expanded until it reached the optimal level, that is, until the marginal cost of the last unit of output was equal to its marginal benefit to society, *ie* the price people are willing to pay for it.

By concentrating on profit maximisation, monopolies may not take account of the other (external) costs to society such as pollution. Again, this is not economically efficient.

7.7   The assertion is true.   [½]

Profit maximisation occurs when *MR* equals *MC*.   [½]

So in this case, profit maximisation means equating *MR* with zero.   [½]

When *MR* is zero, total revenue (*TR*) is at a maximum.   [½]

So, in this case, profit maximisation is equivalent to revenue maximisation.   [½]

This will occur at the quantity of output where the price elasticity of demand for the good is equal to -1.   [½]

Diagram:
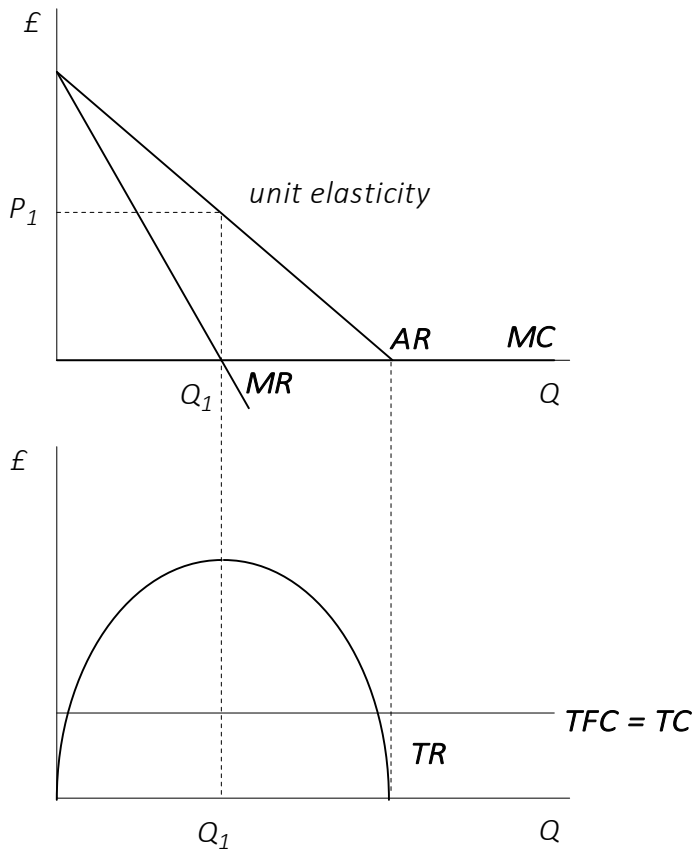
[2]

If the monopolist could not cover its total costs, which would be entirely fixed costs, it should leave the industry in the long run.   [½]

[Maximum 5]

8

Monopolistic competition and oligopoly

Syllabus objectives

2.6   Discuss profit maximisation under imperfect competition.

   1.   Describe the behaviour of firms under monopolistic competition and explain why in this type of market only normal profits are made in the long run.

   2.   Describe the main features of an oligopoly and explain how firms behave in an oligopoly.

   3.   Discuss what determines competition and collusion of firms in an oligopoly and how the strategic decisions of such firms can be explained by game theory.

   4.   Discuss if firms in an oligopoly act in consumers' interest.

Core Reading

Chapter 8 (Sections 1, 2 and 3)   *Pages 217–241*

0   Introduction

Following on from the previous module, we now go on to consider market structures that lie between the extremes of perfect competition and monopoly.

Features of monopolistic competition include:

- a large number of firms

- freedom of entry into the industry

- product differentiation.

Features of oligopoly include:

- barriers to entry

- the interdependence of firms, which may either collude or compete.

It might be useful to revisit the definitions (and examples) of *monopolistic competition* and *oligopoly* from Module 7 before reading on.

1   Monopolistic competition

1.1   What's included in this section

- Assumptions of monopolistic competition

- Equilibrium of the firm

- Limitations of the model

- Non-price competition

- Monopolistic competition and the public interest

1.2   Guidance

The examination is likely to test:

- a *knowledge* of the features of monopolistic competition

- an *ability to draw* the equilibrium diagrams for monopolistic competition

- an *ability to analyse* the effect of changes in cost or revenue on the equilibrium position

- an *ability to compare and evaluate* monopolistic competition with the different market structures, including comparisons with perfect competition and monopoly.

The process for drawing equilibrium diagrams is the same as we described in Module 7:

1.   Draw the demand curve (*D = AR*). For monopolistic competition, each firm faces a (relatively elastic) downward-sloping demand curve.

2.   Draw the marginal revenue curve (*MR*). For monopolistic competition, it should slope downwards and be below the demand curve. If the *D = AR* curve is a straight line, then the *MR* curve is also a straight line. It will have the same vertical intercept and be exactly twice as steep, so that it cuts the horizontal axis exactly halfway between the *AR* intercept and the origin.

3.   Draw in the usual 'J-shaped' marginal cost curve (*MC*).

4.   Find the profit-maximising output by choosing the output level *Q** where *MC* equals *MR*.

5.   Find the price that can be charged for this level of output. The demand curve (*AR*) tells us the price. For monopolistic competition, the price will depend on the level of output. *P** is the price that must be charged.

6.   Draw the 'U-shaped' average cost curve (*AC*) so that the marginal cost cuts through the minimum point on the average cost curve. The vertical position of the average cost curve will depend on whether we want to show the firm earning normal profit, supernormal profit or losses.

     In the short run, all three positions are possible for monopolistic competition. In the long run, monopolistically competitive firms will make normal profits due to the absence of barriers to entry.

7.   Find the average cost of making *Q**. Mark it on the diagram *AC**.

8.   Find the level of profit. If price exceeds average cost, then the firm is making supernormal profit per unit of $P*-AC*$. Total supernormal profit is then $(P*-AC*) \times Q*$.

As suggested in the previous module, it is useful to bear in mind an example of monopolistic competition when going through this material, *eg* restaurants or hairdressers. The assumptions and general characteristics can then be linked back to that example, which should help with memorising, understanding and applying the theory. Box 8.1 provides a nice real-world example of monopolistic competition and considers both the short run and the long run.

1.3   Reading

Task	√*when completed*
Read Chapter 8, pages 218–221.	☐

1.4   Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– independence (of firms in a market)	☐
– product differentiation	☐
– non-price competition	☐
– excess capacity (under monopolistic competition)	☐
• state the assumptions of monopolistic competition	☐
• sketch the firm's cost and revenue curves for monopolistic competition	☐
• explain and illustrate how monopolistically competitive firms determine price and output in the short run and in the long run	☐
• discuss the limitations of the model	☐
• discuss the two major elements of non-price competition	☐
• compare monopolistic competition and perfect competition in terms of:	
– price and output levels	☐
– productive and allocative efficiency	☐
– product choice	☐
• compare monopolistic competition and monopoly in terms of:	
– price	☐
– productive and allocative efficiency.	☐

1.5 Questions

Question

Which one of the following is NOT a feature of monopolistic competition?

A   Equilibrium price will be equal to marginal cost.
B   There are no barriers to entry.
C   Each firm produces a differentiated product.
D   Only normal profits are made in the long run.

Solution

Option A. Marginal cost equals marginal revenue, which is below the downward-sloping demand curve. Thus the equilibrium price is above marginal cost and so the monopolistically competitive firm produces less than the optimum level of output.

Question

Draw the average revenue and the marginal revenue curves for the firm in monopolistic competition.

Solution

The monopolistically competitive firm faces a downward-sloping demand curve. Assuming it is a straight line, we can draw the marginal revenue curve as a straight line that is below the *AR* curve, has the same vertical intercept and is exactly twice as steep.

The curves are shown in the diagram below. Notice that the revenue curves are the same basic shape as those drawn for monopoly, but this demand curve is for a *firm* in monopolistic competition whereas the demand curve facing a monopolist is also the *industry* demand curve since the firm is the industry. As such, the availability of substitutes means that the demand curve facing the firm under monopolistic competition is likely to be more elastic (*ie* flatter) than the demand curve facing the monopolist.
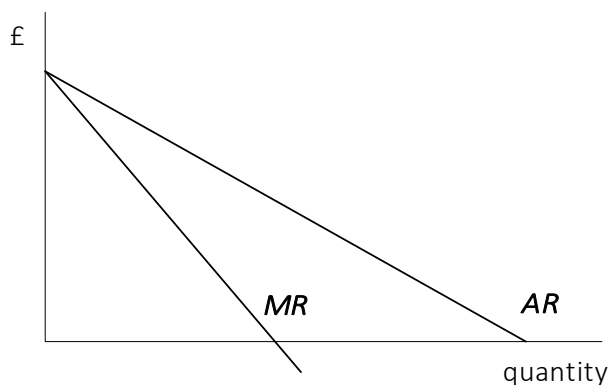
Question

Consider the diagram below. $MR > MC$ at all output levels up to $q*$. So each unit sold adds to profit. Yet at $q*$ average cost is equal to average revenue, so profits are zero.

What is wrong with these statements?
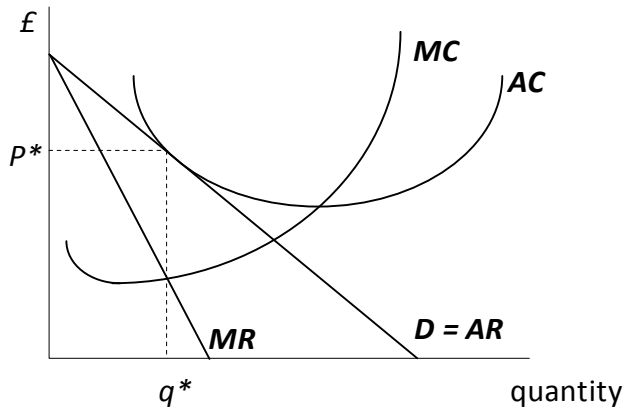
Solution

The fact that $MR > MC$ at all output levels up to $q*$ means that each additional unit up to $q*$ is adding to profit. However, at $q*$, $AR = AC$, which means that $TR = TC$ and the firm is making normal profits only.

This is because the firm must have some fixed costs. So, at $q = 0$, it would make a loss equal to the total fixed cost. However, by the time output has increased to $q*$, TR is exactly sufficient to cover both TFC and TVC (the sum of the MCs), so that normal profit is made.

2   Oligopoly

2.1   What's included in this section

- The two key features of oligopoly

- Competition and collusion

- Industry equilibrium under collusive oligopoly

- Tacit collusion: price leadership

- Tacit collusion: rules of thumb

- Factors favouring collusion

- Non-collusive oligopoly: the breakdown of collusion

- Non-collusive oligopoly: assumptions about rivals' behaviour

- Oligopoly and the public interest

2.2   Guidance

Box 8.2 examines why concentration ratios, one of the main indicators of oligopoly power, vary across industries and across time.

The examination is likely to test:

- a *knowledge* of the features of oligopoly

- an *ability to draw* the equilibrium diagrams for oligopoly

- an *ability to analyse* the effect of changes in cost or revenue on the equilibrium position

- an *ability to compare and evaluate* oligopoly with the different market structures, including comparisons with perfect competition and monopoly

- an *ability to discuss* how oligopolists might behave in various circumstances.

The process for drawing equilibrium diagrams is the same as for each of the other market structures:

1.   Draw the demand curve ($D = AR$). For oligopoly, the demand curve will depend on the model used. It *will* be downward-sloping, and it *might* be kinked.

2.   Draw the marginal revenue curve (MR). For oligopoly, it should slope downwards and be below the demand curve. If the $D = AR$ curve is a straight line, then the MR curve is also a straight line. It will have the same vertical intercept and be exactly twice as steep, so that it cuts the horizontal axis exactly halfway between the AR intercept and the origin.

If it's a kinked demand curve, the two parts of the demand curve are taken separately up to and from the output level corresponding to the kink. Two sections of the MR are drawn, each twice as steep as the relevant part of the demand curve, and there will be a discontinuity at the kink.

3.   Draw in the usual 'J-shaped' marginal cost curve (*MC*). Under the kinked demand curve model, it must cut the *MR* curve through the discontinuity.

4.   Find the profit-maximising output by choosing the output level *Q** where *MC* equals *MR*. Under the kinked demand curve model, this will be at the kink.

5.   Find the price that can be charged for this level of output. The demand curve (*AR*) tells us the price. For oligopoly, the price will depend on the level of output. *P** is the price that must be charged.

        Under the kinked demand curve model, this will be at the kink.

6.   Draw the 'U-shaped' average cost curve (*AC*) so that the marginal cost cuts through the minimum point on the average cost curve. The vertical position of the average cost curve will depend on whether we want to show the firm earning normal profit, supernormal profit or losses.

        In the short run, all three positions are possible. In the long run, oligopolists are likely to make supernormal profits.

7.   Find the average cost of making *Q**. Mark it on the diagram *AC**.

8.   Find the level of profit. If price exceeds average cost, then the firm is making supernormal profit per unit of P^*-AC^*. Total supernormal profit is then $(P^*-AC^*) \times Q^*$.

The textbook discusses several different models of oligopoly and includes diagrams for the following:

- collusive models:
    - cartel
    - price leadership

- non-collusive models:
    - Cournot
    - kinked demand.

2.3   Reading

Task	√*when completed*
Read Chapter 8, pages 221–234.	☐

2.4   Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– interdependence (under oligopoly)	☐
– collusive oligopoly	☐
– non-collusive oligopoly	☐
– cartel	☐
– quota (set by a cartel)	☐
– tacit collusion	☐
– dominant firm price leadership	☐
– barometric firm price leadership	☐
– average cost pricing	☐
– price benchmark	☐
– duopoly	☐
– Cournot model	☐
– Cournot equilibrium	☐
– Nash equilibrium	☐
– residual demand curve	☐
– reaction function (or curve)	☐
– takeover bid	☐
– kinked demand theory	☐
– countervailing power	☐
– oligopsony	☐
• state the two key features of oligopoly	☐
• distinguish between competition and collusion	☐
• describe and illustrate the industry equilibrium for a cartel	☐
• describe the different forms of tacit collusion:	☐
– price leadership	☐
– rules of thumb	☐
• draw the equilibrium diagram for a price leadership model that assumes that:	☐
– the dominant leader takes the part of the market not taken by the other firms	☐
– the dominant or barometric leader takes a constant market share.	☐

Task	√when completed
Continued	
Ensure that you can:	
• state the conditions under which collusion is more likely	☐
• discuss the reasons for collusion breaking down	☐
• state the assumptions underlying the Cournot model	☐
• sketch the cost and revenue curves for the Cournot model of duopoly and illustrate and explain the Cournot equilibrium	☐
• state the assumptions underlying the Bertrand model	☐
• discuss the likely industry profits under the Cournot and Bertrand models	☐
• state the assumptions underlying the kinked demand curve model	☐
• describe and illustrate the equilibrium position in the kinked demand curve model	☐
• discuss the link between the kinked demand model and price stability and state the two major limitations of the theory	☐
• discuss whether oligopoly is beneficial to society.	☐

2.5 Questions

Question

What is oligopoly?

A   the takeover of many firms
B   a special form of perfect competition
C   competition among the few
D   collusive behaviour

Solution

Option C. This is by definition. Note that collusive behaviour is a possible feature of oligopoly but does not always occur.

Question

State the main features of oligopoly.

Solution

The main features of oligopoly include:

- a few firms share a large proportion of the industry, *ie* concentration ratios are high

- there are barriers to the entry of new firms into the industry

- firms' products could be differentiated (*eg* cars) or identical (*eg* electricity)

- the oligopolist faces a downward-sloping demand curve and so has some control over its price (*ie* it is a *price maker*)

- supernormal profit can be earned in the long run

- firms are interdependent

- oligopolies can be collusive or non-collusive

- price stability is common (as illustrated by the kinked demand curve)

- non-price competition, *eg* advertising, is common

- the oligopolist produces less than the optimal level of output

- the oligopolist benefits from economies of scale

- the oligopolist invests in R&D

- the oligopolist might suffer from X inefficiency.

Question

Cartels are best described as:

A   government regulators pursuing antitrust policies.
B   formal collusive agreements.
C   rules of thumb.
D   small horse-drawn wagons.

Solution

Option B. This is a definition.

Question

Explain, with the aid of a diagram, the price leadership model, in which the dominant or barometric leader assumes it will maintain a constant market share.

Solution

This is a model of *tacit collusion*, in which a dominant firm (often the largest) or a barometric firm (one that is the best barometer of market conditions), sets it price, which the other firms follow. If the leader assumes that its lead will be followed and that it will maintain a constant market share, then it will estimate its demand and marginal revenue curves, and set its price at the output level where its $MR = MC$. This is Q_{leader} in the diagram below.
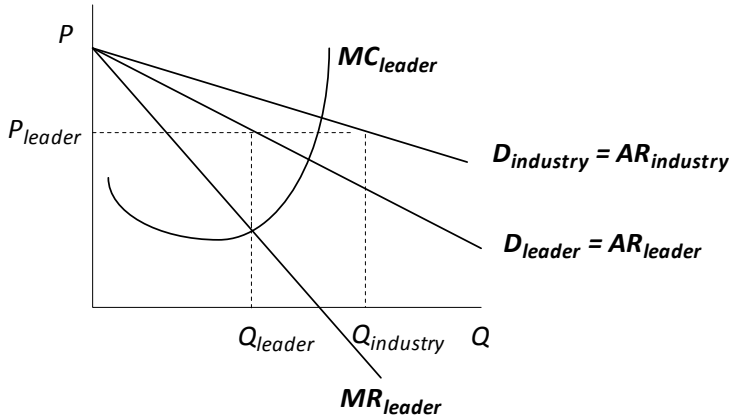
The rest of the industry adopts the same price (P_{leader}) and the industry quantity ($Q_{industry}$) is determined by the market demand curve ($D_{industry}$). So, Q_{leader} is supplied by the dominant firm and $Q_{industry} - Q_{leader}$ by the follower firms.

Question

Draw a diagram to illustrate the Cournot model of duopoly with Firms X and Y. You should assume that Firm X believes that Firm Y will produce a quantity Q_Y.

Solution
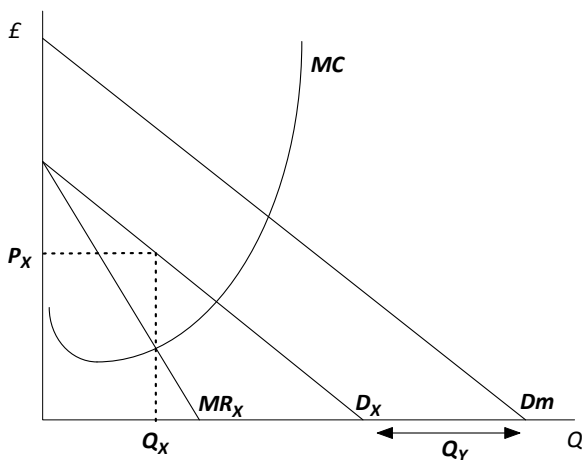
Question

Explain why industry profit under the Cournot model of duopoly will be lower than under a monopoly, but higher than under perfect competition.

Solution

Industry profit will be lower than under a monopoly because the price under duopoly will be lower than the price under monopoly. This is because the demand curve facing the duopolist is further to the left than the demand curve facing the monopolist.

Industry profit will be higher than under perfect competition because oligopolists will be able to make supernormal profits even in the long run. This is because barriers to entry will prevent new firms entering the market and competing away the supernormal profit. Even if firms are making only normal profit in the long run, price would be greater than marginal cost in oligopoly and therefore higher than in perfect competition (where price equals marginal cost), assuming the same costs.

Question

The kinked demand curve theory of oligopoly implies that the oligopolist:

A   will seek to make only satisfactory rather than maximum profits.
B   has a discontinuity in its marginal revenue curve.
C   has a discontinuity in its marginal cost curve.
D   has a discontinuity in its average revenue curve.

Solution

Option B. The kink in the oligopolist's demand (= average revenue) curve gives rise to a discontinuity in the marginal revenue curve at the level of output corresponding to the kink.

Question

Discuss how imperfect competition compares with perfect competition in terms of the level of profits earned and the level of output produced.

Solution

Oligopolists can earn supernormal profit in the long run. Like firms in perfect competition, firms in monopolistic competition can typically earn only normal profit in the long run.

In the absence of externalities (which are discussed in detail in Module 10), the optimal output level is that where $P = MC$.

Under monopolistic competition and oligopoly, firms choose to produce at their profit-maximising output level (where $P > MC$). This results in a lower than optimal level of output. Conversely, under perfect competition, firms maximise profits at the output level where $P = MC$, *ie* at the optimal output level.

3 Game theory

3.1 What's included in this section

- Simultaneous single-move games

- Sequential-move games

- The importance of threats and promises

- Assessing the simple theory of games

3.2 Guidance

Game theory is used to analyse the strategic interactions between the players of a 'game'. As such, one of its uses is to model the interdependence of firms in an oligopoly.

The descriptions of the different games and strategies in the textbook can be a little confusing to read and the best way to understand the theory is to apply it to questions.

However, the textbook doesn't set its figures out in an intuitive way. In Tables 8.1 and 8.2, the tables are set out with Y's price as the 'across' variable and X's price as the 'down' variable, and then the profits are stated as (Y's profit, X's profit).

In addition, there is an error in the textbook: on page 235, in the third paragraph, the third sentence should read: 'Firm Y's best response once again is to charge £1.80, earning it profits of **£8** million, as illustrated in cell D.'

Box 8.5 discusses the prisoners' dilemma, which has been examined in Subject CT7, usually as multiple-choice questions.

3.3 Reading

Task	√when completed
Read Chapter 8, pages 234–241.	☐

3.4 Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– game theory	☐
– simultaneous single-move game	☐
– dominant strategy and dominant-strategy game	☐
– normal-form game.	☐

Task	√*when completed*
Continued	
Ensure that you can:	
• define the following key terms:	
– prisoners' dilemma	☐
– trigger strategy	☐
– backwards induction	☐
– sequential-move game	☐
– decision tree (or game tree)	☐
– first-mover advantage	☐
– credible threat (or promise)	☐
– maximin	☐
– maximax	☐
• identify and discuss the different strategies that firms might adopt	☐
• identify and discuss the dominant and Nash equilibrium positions of a game	☐
• sketch a decision tree for a given sequential-move game	☐
• discuss the benefits and limitations of game theory.	☐

3.5   Questions

Question

'Once a firm observes that its rival has broken some agreed behaviour it will never co-operate with them ever again.'

This is a description of which type of strategy?

A   trigger strategy
B   dominant strategy
C   hit and run strategy
D   maximin strategy

Solution

Option A. This is a definition.

Question

Clogs plc and Nest plc operate in a duopolistic market. Each company has fixed costs of £0.5m and variable costs of £1 per unit. The product is sold for £1.50 per unit. They are considering the amount they should spend on advertising.

If they each spend a low amount on advertising, *ie* £1m, the total market of 10m units will be shared equally between them. If they each spend a high amount on advertising, *ie* £4m, the total market of 20m units will be shared equally between them. If one firm spends a low amount and the other a high amount, the total market of 15m units will be shared in the ratio 1:4 respectively.

(i)   Complete the payoff table below to show the profit received by each company for each combination of strategies.

		Nest plc chooses	
		High	*Low*
Clogs plc chooses	*High*		
	Low		

(ii)   State the maximin and maximax strategies for each firm and explain whether or not a dominant strategy exists for Clogs plc or Nest plc.

(iii)   Comment on the likely outcome.

Solution

(i)   *The payoff table*

		Nest plc chooses	
		High	*Low*
Clogs plc chooses	*High*	(£0.5m, £0.5m)	(£1.5m, £0)
	Low	(£0, £1.5m)	(£1m, £1m)

For example:

If both firms choose a high advertising strategy, each firm sells 10m units. Total revenue for each firm is therefore £15m, total variable costs are £10m and total fixed costs (including advertising) are £4.5m. Hence profit is £0.5m.

(ii)   *Dominant strategies*

The *maximin* strategy for *Clogs plc* is *high* (as it maximises the lowest possible payoff, *ie* $0.5 > 0$).

The *maximax* strategy for *Clogs plc* is *high* (as it maximises the highest possible payoff, *ie* $1.5 > 1$).

Since the payoff table is symmetrical, the *maximin* and *maximax* strategies for *Nest plc* are also both *high*.

A *dominant strategy* is a strategy that is best whatever choice the other player makes.

If Clogs plc chooses a high advertising strategy, then Nest plc would be better off with a high strategy (£0.5*m* > £0), whereas if Clogs plc chooses low, then Nest plc would again be better off with high (£1.5*m* > £1*m*). Therefore the dominant strategy for Nest plc is a high strategy.

As the same argument applies to Clogs plc, high is the dominant strategy for both firms.

(iii)   ***The likely outcome***

It is likely that both companies will adopt the dominant strategy of high advertising expenditure and therefore earn a profit of £0.5*m* each. This is the dominant equilibrium.

However, this is not the best outcome for the two firms. If they colluded and agreed to spend a low amount on advertising, they would each earn a profit of £1*m*.

This outcome resulting from collusion may not be sustainable in practice as both firms will have an incentive to cheat on the agreement.

*Note that the (High, High) dominant equilibrium is an example of the **prisoners' dilemma**, as the firms both end up doing worse than if there were able to co-operate and collude. This equilibrium is also a Nash equilibrium, because starting from that position, neither firm can do better, given the strategy choice of the other firm.*

Module 8 Practice Questions

8.1 A market in which firms produce differentiated products and enjoy normal profits could be described as:

Exam style

A   a monopoly.
B   an oligopoly.
C   monopolistically competitive.
D   perfectly competitive.   [1½]

8.2 An industry has the following characteristics:

Exam style

- large numbers of buyers and sellers

- slightly differentiated products

- no entry barriers

- supernormal profits made by all firms.

The market conditions of this industry are those of:

A   perfect competition in the short run.
B   monopolistic competition in the short run.
C   oligopoly in the short run.
D   monopolistic competition in the long run.   [1½]

8.3 The market structure in which price is likely to be furthest from marginal cost is known as:

Exam style

A   monopoly.
B   perfect competition.
C   oligopoly.
D   monopolistic competition.   [1½]

8.4 Draw diagrams to illustrate the long-run equilibrium position for a firm in:

(i)   monopoly

(ii)   oligopoly (using the kinked demand theory)

(iii)   monopolistic competition

(iv)   perfect competition.

8.5 In the long run, a firm operating under conditions of monopolistic competition will produce at an output at which:

Exam style

A   average total cost equals average revenue.
B   average total cost is less than average revenue.
C   average total cost is at a minimum.
D   marginal cost is equal to average total cost.   [1½]

8.6   Suppose a firm in monopolistic competition is in long-run equilibrium. What is the effect on the firm's output, price and profit in the short run and in the long run of:

Exam style

(i)   a rise in the firm's fixed costs of production, *eg* an increase in rent   [5]

(ii)   a decrease in the firm's variable costs of production, *eg* a reduction in wages.   [5]

[Total 10]

8.7   Outline the key feature that distinguishes:

(a)   monopolistic competition from perfect competition

(b)   oligopoly from monopoly.

8.8   Compare and contrast oligopoly, monopolistic competition and perfect competition in terms of:

(a)   the products that they offer

(b)   the level of profits that they make.

8.9   Discuss the relative benefits to consumers of the four main market structures.   [10]

Exam style

8.10   Consider the following payoff matrix for two firms, A and B. The payoffs show the profit resulting from various combinations of low-price and high-price strategies.

Exam style

<div align="center">

Firm B

		High price	Low price
Firm A	High price	(50, 50)	(10, 80)
	Low price	(80, 10)	(20, 20)

</div>

(i)   State which strategy would maximise joint profit.   [1]

(ii)   Determine the dominant strategy for each firm and state whether there a dominant equilibrium.   [2]

(iii)   State whether this game has a Nash equilibrium.   [1]

(iv)   Explain what happens to the payoff table if Firms A and B introduce a price matching clause (*ie* a promise to match the lowest price offered by a competitor) into their contracts with customers.   [1]

(iv)   State which strategy firms would choose in this situation.   [1]

[Total 6]

Module 8 Solutions

8.1   Option C. Differentiated products are often produced by firms in an oligopoly and always under conditions of monopolistic competition. (Monopolists may also produce differentiated products as well, to cover all market niches.) Normal profits are enjoyed only by firms under monopolistic competition and perfect competition – due to the absence of barriers to entry. Thus, monopolistic competition is the only market type consistent with both differentiated products and normal profits.

[1½]

8.2   Option B. The first three characteristics describe monopolistic competition. However in the long run, most firms in monopolistic competition can only make normal profits. Therefore this must be a short-run scenario.   [1½]

8.3   Option A.

In perfect competition, demand for the products of each firm is totally elastic and $P = MC$. However, under each of the other three market structures, $MR = MC$ at the profit-maximising output level, and the demand curve is above the MR curve. Consequently, $P > MC$.

The more inelastic demand is (*ie* the steeper the demand curve), the further MR is below the demand curve, and hence the further $MR = MC$ is below price. Typically, the absence of substitutes means that a monopolist faces more inelastic demand than both an oligopolist and each firm under monopolistic competition. Hence, the excess of price over MC will be greater.

[1½]

8.4   (i)   *Monopoly*
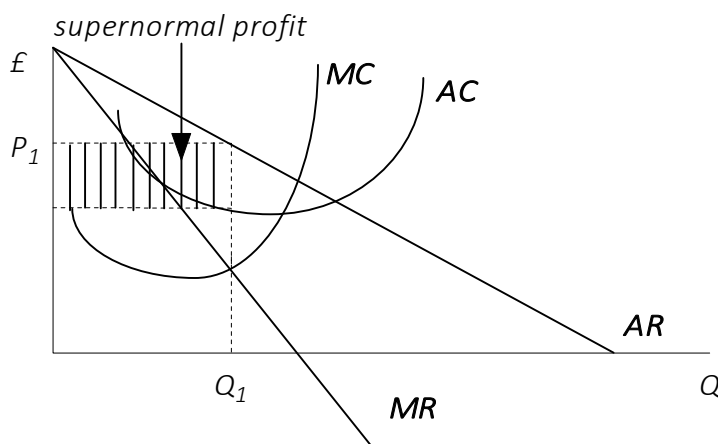
(ii)   *Oligopoly (using the kinked demand theory)*
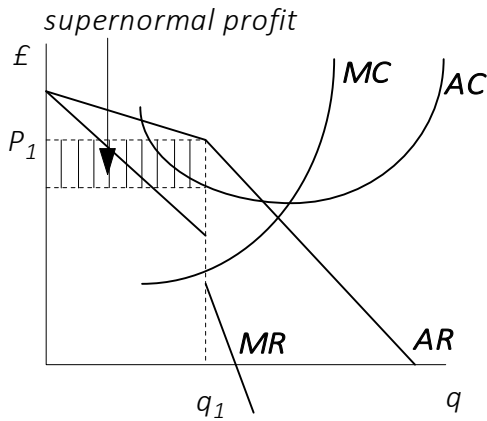
(iii)   *Monopolistic competition*
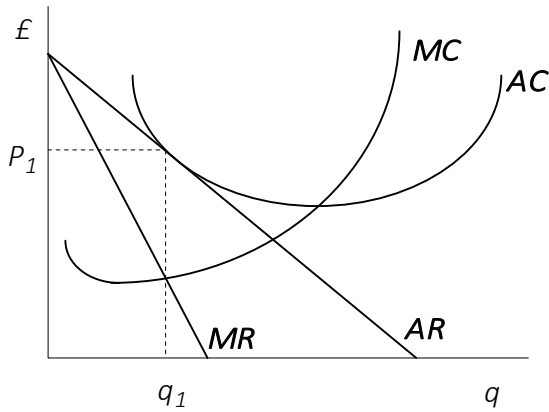
(iv)   *Perfect competition*
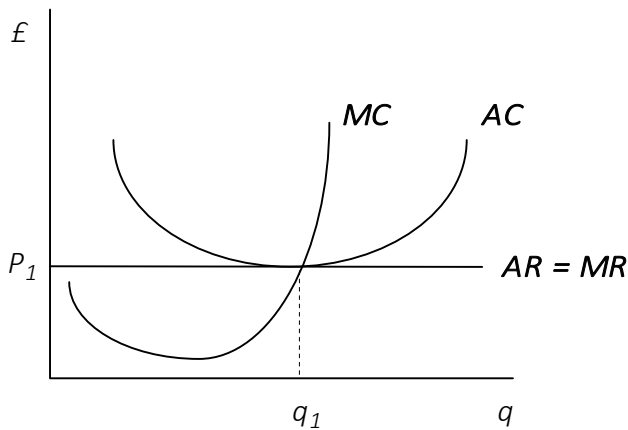
Note that in parts (i) and (ii), firms are assumed to make long-run supernormal profits due to barriers to entry, whereas in parts (iii) and (iv), their absence results in normal profits.

8.5   Option A. In the long run, a monopolistically competitive firm will make normal profits. This is at the point which average (total) cost equals average revenue. Note that due to the downward-sloping demand curve, the firm will not produce at the minimum average total cost.   [1½]

8.6   **(i)**   ***A rise in fixed costs***

A rise in fixed costs does not affect the marginal cost of production. (This is because the marginal cost is the *variable* cost of producing an additional unit of output.) Thus the rise in fixed costs leaves the marginal cost and average variable cost curves unchanged but raises the average cost of production.   [1]

Since the marginal cost and the marginal revenue curves are unchanged the profit-maximising level of output is unchanged (at $q_1 = q_2$). However, since the average cost curve has risen, firms are now making losses (as $AC_2 > P_1 = P_2$).   [1]

The firm will carry on producing in the short run as the price covers the average variable cost, *ie* $P_2 > AVC$.   [½]

This is assumed in the following diagram:
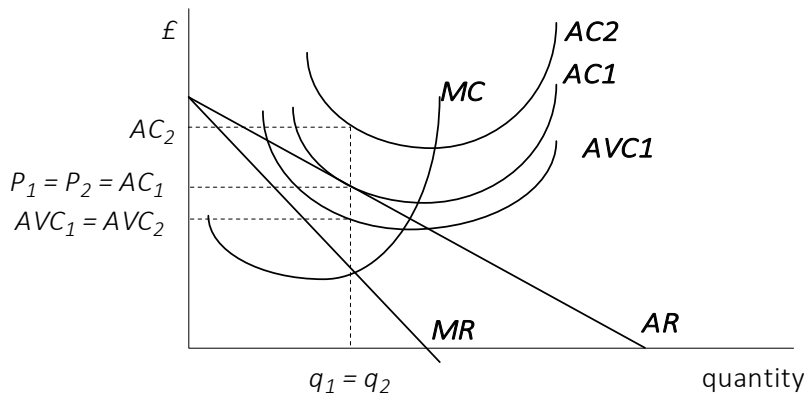
[2 for diagram]

In the long run, loss-making firms will begin to leave the industry. As they do, the demand curve for those remaining in the industry will shift to the right. This process will continue until the remaining firms return to normal profit, *ie* when the *AR* is tangential to the *AC*.   [1]

[Maximum 5]

(ii)   ***A fall in variable costs***

A fall in variable costs will reduce both the average and marginal cost curves from AC_1 to AC_2 and from MC_1 to MC_2 on the diagram below.   [1]

The profit-maximising level of output will therefore rise from q_1 to q_2 and the price charged will fall from P_1 to P_2.   [½]

Firms will make supernormal profit in the short run as $P_2 > AC_2$.   [½]

This can be seen in the following diagram:
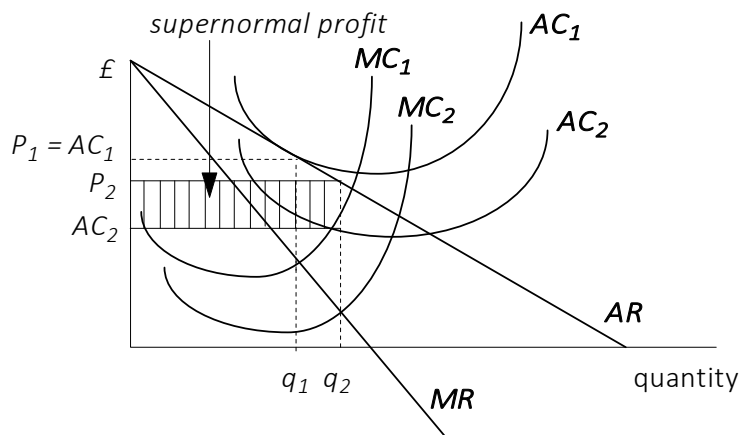
[2 for diagram]

In the long run, new firms will enter the industry, attracted by the supernormal profit. As they enter, some customers will desert the original firms and swap to the goods of the new firms.   [½]

Therefore the demand curves of the original firms will shift to the left, leading to a fall in price, and the supernormal profit will be 'competed away'.   [½]

[Total 5]

8.7   (a)   *Monopolistic competition and perfect competition*

The key feature that distinguishes monopolistic competition from perfect competition is the monopolistically competitive firm's ability to change the price it charges for its products without losing all its sales, *ie* it is a price maker with a downward-sloping demand curve.

This results from firms supplying differentiated products, …

… and consumers having imperfect information.

(b)   *Oligopoly and monopoly*

The key feature that distinguishes oligopoly from monopoly is that of competition.

A monopolist has no competitors within the industry, …

… whereas an oligopolist's freedom to act is constrained by how it believes its competitors will react.

8.8   (a)   *Products offered*

Oligopolistic firms tend to indulge in product proliferation – offering lots of varieties of a particular type of product.

They also tend to reinforce the product differentiation in the mind of the consumer by the use of advertising.

Monopolistically competitive firms sell a product that is differentiated from their competitors' products.

In contrast, perfectly competitive firms are assumed to sell a homogeneous product.

(b) *Level of profits*

In oligopolistic industries, there are a few large firms, which tend to erect strategic barriers to discourage other firms from entering the market. Oligopoly firms therefore make supernormal profits in the long run.

In *both* perfect competition and monopolistic competition there is free entry and exit, therefore firms make only normal profits in the long run.

8.9 *Perfect competition*

Under perfect competition, firms are forced to be productively efficient in order to survive.   [½]

This means that each good is produced at the minimum cost possible, which should lead to lower prices for consumers.   [½]

Firms in perfect competition produce identical products, and so there is typically less choice for consumers than under the other market structures.   [½]

Due to high levels of competition (and perfect knowledge), perfectly competitive firms must produce good quality products, which will also benefit consumers.   [½]

Freedom of entry ensures that firms do not make supernormal profits in the long run, and therefore do not exploit consumers.   [½]

A perfectly competitive market structure produces the optimum output level (where $P = MC$), so welfare is maximised.   [½]

No other market structure produces at this output level unless forced to, *eg* by the government.
                                                                                    [½]

Monopolistic competition

Compared to perfect competition, monopolistic competition will typically lead to:

- slightly higher prices   [½]

- less efficient production (since firms do not produce at minimum cost)   [½]

- an output level lower than the optimal level of output.   [½]

On the other hand, consumers will benefit from having a variety of products.   [½]

Monopoly

Monopolists are not forced to be efficient, which may ultimately lead to higher prices for the consumer.   [½]

The existence of barriers to entry means that monopolists:

- •   need not necessarily respond to consumers' demands   [½]

- •   can make supernormal profits in the long run, which, arguably, does not benefit consumers.   [½]

All else being equal, compared to perfect competition, a monopolist will typically produce a lower output at a higher price.   [½]

However, a monopolist is likely to have the profits available to fund research and development to help improve efficiency and develop new produts.   [½]

Its motivations for doing so include that:

- •   it will itself benefit from being efficient in the form of higher profits   [½]

- •   if it is inefficient, it may face the threat of competition or takeover.   [½]

Hence monopolists may achieve high levels of efficiency which could lead to more reasonable prices for consumers.   [½]

Furthermore, a monopoly may be able to benefit from economies of scale, which could further reduce prices.   [½]

If the monopoly is producing in a perfectly contestable market, then in theory:

- •   prices will be kept down (so that the monopolist is making only normal profits)   [½]

- •   the monopolist will produce as efficiently as possible.   [½]

These factors, combined with the existence of economies of scale for a monopolist in a *perfectly contestable market*, could lead to the best possible scenario for consumers.   [½]

Oligopoly

Oligopoly may not act in the best interests of consumers if the oligopolists:

- •   collude to jointly maximise industry profits (so that prices are high)   [½]

- •   are individually too small to benefit fully from economies of scale   [½]

- •   engage in significant advertising, adding to supply costs.   [½]

These problems will be smaller if:

- •   the oligopolists do not collude (though they might advertise more without collusion)   [½]

- •   there is some degree of price competition   [½]

- •   barriers to entry are weak   [½]

- •   countervailing power exists, *ie* the power of monopolistic / oligopolistic sellers is offset by powerful buyers who can prevent the price from being pushed up.   [½]

Furthermore, oligopoly may actually benefit consumers since:

- oligopolists will have a significant *incentive* to use their supernormal profit on research and development to improve efficiency and innovation   [½]

- product differentiation may increase choice.   [½]

[Maximum 10]

8.10 (i) ***Strategy to maximise joint profit***

A high-price strategy by both firms would maximise joint profit.   [1]

(ii) ***Dominant strategies***

Firm A: If Firm B adopts a high-price strategy, then Firm A should adopt a low-price strategy; if Firm B adopts a low-price strategy, then Firm A should adopt a low-price strategy. Thus, Firm A's dominant strategy is a low price.   [1]

Similarly (and by symmetry), Firm B's dominant strategy is a low price.   [½]

Thus the dominant equilibrium is a low-price strategy by both firms.   [½]

[Total 2]

(iii) ***Nash equilibrium***

A dominant equilibrium is always a Nash equilibrium. Hence (Low, Low) is a Nash equilibrium. [1]

(iv) ***Effect on the payoff table of price matching clause***

If Firms A and B introduce a price matching clause into their contracts with customers, then there cannot be any difference in price and therefore the bottom-left cell and the top-right cell disappear. If one firm has a high price and the other a low price, then both have to charge a low price.   [1]

(v) ***Strategy if there is a price matching clause***

In this situation, both firms would charge a high price.   [1]

A multiple-move, tit-for-tat game, ie where a firm cuts prices if the rival does so first, would lead to the same payoff table as in (iii) and the same outcome as in (iv). The price matching clause provides a credible threat, ie one that is believable because it is in the interests of the firm to carry it out.

9

Pricing strategies

Syllabus objectives

2.7   Assess various pricing strategies that firms can adopt.

1.   Describe how prices are determined in practice and factors that affect the ability of a firm to determine its prices.

2.   Describe average cost pricing and price discrimination.

3.   Discuss pricing strategy for multiple products and explain how pricing varies with the stage in the life of a product.

Core Reading

Chapter 7 (Section 3, subsection on limit pricing)   *Pages 205–206*

Chapter 8 (Section 4)   *Pages 241–248*

Chapter 9 (Section 6)   *Pages 271–275*

From the textbook:

Economics for Business. Sloman, J., Garratt, D., Guest, J., Jones, E. 7th ed. Pearson 2016, which students can access via the ebook (MyiLibrary) service using their Athens password: http://lib.myilibrary.com?id=926627&ref=Athens

Chapter 17 (Sections 4 and 6)   *Pages 289–290, 291–294*

0   Introduction

The traditional theory of the firm (as described in the previous module) requires the firm to determine its profit-maximising price and output level by equating marginal cost and marginal revenue. In practice, however, a firm is unlikely to know its exact costs and revenues, and so a variety of other strategies are used to determine the price to charge.

In addition, the price a firm charges for a good may vary:

*   between customers (price discrimination)

*   over the life cycle of the good

*   according to:

        –   the aims of the firm, *eg* maximising sales or profits

        –   the level of competition faced

        –   the information held on demand and costs.

This module considers the different strategies that firms use in practice to determine their prices, having regard to the above factors and also a number of other relevant issues. Bear in mind that a combination of pricing strategies could be used for a particular product.

In addition to knowing and understanding the strategies discussed in this module it is also necessary to be able to draw the relevant diagrams to illustrate them, some of which require a fair degree of practice.

1   Cost-based pricing and limit pricing

1.1   What's included in this section

- Cost-based pricing

- Variations in the mark-up

- Limit pricing

1.2   Guidance

Cost-based pricing is the main topic of this section, however, limit pricing – which is also mentioned in Module 7 – is covered too.

Cost-based pricing is widely used in practice, if only as a starting point for determining the price for a product. This is because the firm needs to ensure that the price charged more than covers costs, so that it makes a profit. Note that the mark-up over average cost may vary between products, or even with output for the same product.

1.3   Reading

Task	*√when completed*
Read Chapter 9, pages 271–275.	☐
Read Chapter 7, pages 205–206 (subsection on limit pricing).	☐

1.4   Checklist

Task	*√when completed*
Ensure that you can:	
• define the following key terms:	
– average cost or mark-up pricing	☐
– limit pricing	☐
• outline the factors affecting the mark-up	☐
• explain and illustrate limit pricing using cost and revenue curves.	☐

1.5   Questions

Question

In which market structure are firms price takers?

A   perfect competition
B   oligopoly
C   duopoly
D   monopoly

Solution

Option A. Under *perfect competition*, a firm has no control over the price it charges, but must take the market price as given.

Question

Limit pricing describes the strategy under which a monopolist (or oligopolist) charges a price that may be below what level in order to deter new entrants?

I   the short-run profit-maximising price
II   the minimum average cost for a new entrant
III   its own minimum average cost

A   I and II
B   II and III
C   I only
D   III only

Solution

Option A. A new entrant is likely to have higher average costs than an existing company, *eg* due to economies of scale. So, if the existing firm charges a price that is *lower* than a new entrant's minimum average cost, then the potential new entrant will not be attracted into the industry. This may well be below the existing firm's short-run profit maximising price. This describes limit pricing and this covers Options I and II. Option III describes *predatory pricing*, which is covered in the next section.

Question

List the factors that affect the mark-up used under cost-based pricing

Solution

- the firm's aims, *eg* its profit / sales targets

- competitors' prices

- the likely actions of rivals, their responses to changes in this firm's price and how these responses will affect demand

- whether the market is expanding or contracting

- the firm's level of market power

- the stability of input prices, *eg* rising cost of raw materials

- the elasticity of demand for the product

- the firm's desire to cross-subsidise profits from this product with that of other products

- general market conditions, *eg* boom / recession

2 Price discrimination

2.1 What's included in this section

- The three different types of price discrimination

- Conditions necessary for price discrimination to operate

- Advantages to the firm

- Profit-maximising prices and output

- Price discrimination and the public interest

2.2 Guidance

The exam is likely to test:

- a *knowledge* of the three different types of price discrimination

- an *ability to illustrate* them with diagrams.

It is therefore important to pay attention to the diagrams to ensure a good understanding and (if necessary) the ability to reproduce them.

The third-degree price discrimination diagram is particularly tricky to draw as it involves three separate graphs. The order in which the curves are drawn is important in getting them right:

1. Draw the revenue curves ($D = AR$ and MR) for the individual markets.

2. Draw the kinked $D = AR$ curve for the total market as the sum of those of the individual markets.

3. Draw the MR curve for the total market. This has a gap below the kink in the $D = AR$ curve. Note that the two sections of the MR curve would each have the same vertical intercept (if they were drawn in full) and are twice as steep as the corresponding sections of the $D = AR$ curve.

4. Draw the marginal cost curve on the total market diagram. For simplicity, the textbook assumes a constant MC, but it could be the usual upward-sloping MC curve.

5. The intersection of MR and MC in the total market graph gives the total quantity sold to maximise profit across both markets; it can also be used to determine the price that would be charged by a single-price firm.

6. The MC is then equated with the MR in each of the individual market graphs to give the quantity sold in each individual market. The individual demand curves then give the price that should be charged in each market.

2.3 Reading

Task	√when completed
Read *Chapter 8, pages 241–248.*	☐

2.4 Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– price discrimination	☐
– first-degree price discrimination (also known as perfect price discrimination or personalised pricing)	☐
– second-degree price discrimination	☐
– third-degree price discrimination	☐
– peak-load pricing	☐
– predatory pricing	☐
• discuss how each of the three types of price discrimination are applied in practice	☐
• outline the three conditions necessary for price discrimination	☐
• state the main advantages to the firm of using price discrimination	☐
• illustrate how the firm (a) increases total revenue and (b) determines the profit-maximising prices and total output, under:	
– first-degree price discrimination	☐
– third-degree price discrimination	☐
– peak-load pricing	☐
• discuss whether or not price discrimination is in the public interest.	☐

2.5 Questions

Question

First-degree price discrimination (FDPD) refers to the situation where:

A   a firm charges customers different prices according to how much they purchase.

B   consumers are grouped into independent markets and a separate price is charged in each market.

C   a firm charges each customer the maximum price he/she is prepared to pay.

D   different firms charge different prices for the same product.

Solution

Option C.

Question

Which of the following situations describes a form of second-degree price discrimination (SDPD)?

A   A firm charges customers different prices according to how much they purchase.

B   Consumers are grouped into independent markets and a separate price is charged in each market.

C   A firm charges each customer the maximum price he/she is prepared to pay.

D   Different firms charge different prices for the same product.

Solution

Option A. An example of SDPD in practice is 'buy-one-get-one-free' offers.

Question

Third-degree price discrimination (TDPD) refers to the situation where:

A   a firm charges customers different prices according to how much they purchase.

B   consumers are grouped into independent markets and a separate price is charged in each market.

C   a firm charges each customer the maximum price he/she is prepared to pay.

D   different firms charge different prices for the same product.

Solution

Option B. Note that Option D does not describe price discrimination. It is just describing the practice of different firms charging different prices that might be true in any imperfect market.

Question

Match the terms (1 to 7) with the definitions (A to G):

1	Limit pricing	A	A firm charges each consumer for each unit the maximum price that the consumer is willing to pay for that unit.
2	Average cost pricing	B	A firm offers consumers a range of different pricing options for the same or similar product. Consumers are then free to choose whichever option they wish, but the price is often dependent on some factor such as the quantity purchased.
3	First-degree PD	C	A firm adds a mark-up to average cost.
4	Second-degree PD	D	Price discrimination (second or third degree) where a higher price is charged in peak periods and a lower price in off-peak periods.
5	Third-degree PD	E	An existing firm deliberately keeps its prices below the short-run profit-maximising level so as to deter new entrants to the market.
6	Predatory pricing	F	A firm divides consumers into different groups based on some characteristic that is relatively easy to observe and informative about how much consumers are willing to pay. The firm then charges a different price to consumers in different groups, but the same price to all the consumers within a group.
7	Peak-load pricing	G	A firm sets its price below its average cost in order to drive competitors out of business.

Solution

1	Limit pricing	E	An existing firm deliberately keeps its prices below the short-run profit-maximising level so as to deter new entrants to the market.
2	Average cost pricing	C	A firm adds a mark-up to average cost.
3	First-degree PD	A	A firm charges each consumer for each unit the maximum price that the consumer is willing to pay for that unit.
4	Second-degree PD	B	A firm offers consumers a range of different pricing options for the same or similar product. Consumers are then free to choose whichever option they wish, but the price is often dependent on some factor such as the quantity purchased.
5	Third-degree PD	F	A firm divides consumers into different groups based on some characteristic that is relatively easy to observe and informative about how much consumers are willing to pay. The firm then charges a different price to consumers in different groups, but the same price to all the consumers within a group.
6	Predatory pricing	G	A firm sets its price below its average cost in order to drive competitors out of business.
7	Peak-load pricing	D	Price discrimination (second or third degree) where a higher price is charged in peak periods and a lower price in off-peak periods.

3   Multiple product pricing

3.1   What's included in this section

- Interrelated demand

- Interrelated production

3.2   Guidance

This is a short section and it should be quite quick to work through. It introduces two more pricing strategies (*loss leaders* and *full-range pricing*), and also considers how to price *by-products*.

Don't forget to use the alternative textbook for this section.

3.3   Reading

Task	√*when completed*
Read Economics for Business, Chapter 17, pages 289–290. *(See front page for access details.)*	☐

3.4   Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– loss leader	☐
– full-range pricing	☐
– by-product	☐
• give examples of situations in which a firm considers the pricing of its products as a whole rather than as individual products.	☐

3.5   Questions

Question

(i)   Explain how a profit-maximising firm ought to determine the price of a by-product.

(ii)   State how firms often decide on the viability of selling a by-product in practice.

Solution

(i)   *How a profit-maximising firm ought to determine the price of a by-product*

First the firm needs to allocate the costs of production as far as possible between the primary product and the by-product. It should then add the marginal costs (*MC*) from each product to get a *MC* curve for the combined product.

Likewise, the marginal revenue (*MR*) curves for each product need to first be identified separately, and then summed to obtain a combined *MR* curve. The profit-maximising combined output then arises at the output level where the combined *MR* and *MC* curves intersect.

Finally, the combined output should be split into the corresponding individual outputs of each product, and the price for both the primary product and the by-product, obtained from the individual demand curves.

(ii)   *How firms often decide on the viability of selling a by-product in practice*

In practice, many firms first of all decide whether or not to produce the primary product. If they do, they will then sell the by-product if the specific costs associated with preparing it for sale are more than covered by the price it can be sold at.

4   Pricing and the product life cycle

4.1   What's included in this section

- Pricing at different stages of the product life cycle

4.2   Guidance

It might be useful to consider specific products when reading through this section, in particular, the textbook gives the following examples:

- *launch* – electric cars, biodiesel

- *growth* – smartphones, large LED televisions

- *maturity* – washing machines, do-it-yourself (DIY) products

- *decline* – analogue televisions, traditional (non-smart) phones.

Don't forget to use the alternative textbook for this section.

4.3   Reading

Task	√*when completed*
Read Economics for Business, Chapter 17, *pages 291–294.* *(See front page for access details.)*	☐

4.4   Checklist

Task	√*when completed*
Ensure that you can: • describe the four stages of the product life cycle	☐
• explain and illustrate how pricing varies with each stage in the life of a product.	☐

4.5   Questions

Question

Explain how the degree of competition is likely to vary during the four stages of the product life cycle.

Solution

Competition is likely to be low during the *launch stage* of the product life cycle. This is because the firm is likely to have a monopoly on the new product, unless its rivals are simultaneously launching similar products.

Unless there are strong barriers to entry, competition is likely to increase during the *growth stage* of the product life cycle, as the rapid growth in sales and possibly profits will attract new entrants into the market. The pricing policy adopted by the original firm will partly determine the number of new entrants – a low price being a deterrent to entry. It is possible that the market will become oligopolistic and firms may collude to try and maintain prices and profit levels. New firms might just follow the leader on price, but might compete with minor product differences.

As new firms continue to enter the market, so competition is likely to increase even further during the *maturity stage* of the product life cycle. Any collusion may break down and price wars may break out as firms fight for market share.

During the *decline stage* of the product life cycle, the level of competition may actually reduce, as some firms are unable to make profits and so leave the industry. The remaining industry may then become more oligopolistic again.

Module 9 Practice Questions

9.1   Explain with the aid of a diagram what limit pricing means.   [5]

Exam style

9.2   Define third-degree price discrimination and outline the conditions that must hold for a firm to be able to practise third-degree price discrimination.   [4]

Exam style

9.3   (i)   Using supporting diagrams show how a profit-maximising firm will practise third-degree price discrimination by dividing its market into two distinct markets A and B with different demand elasticities. Show the price in the market with inelastic demand (Market A) and in the market with a more elastic demand (Market B) and the overall output of the firm made up of demand in both Market A and Market B.   [3]

Exam style

      (ii) Give an example of second-degree and third-degree price discrimination.   [2]
                                                                                  [Total 5]

9.4   A firm that produces a main product and a by-product will maximise profits if it:

Exam style

      A   decides on the viability of producing the by-product after it has made the decision to produce the main product.

      B   selects the level of output of the by-product where marginal cost of the by-product equals its marginal revenue.

      C   selects the combined output where the combined marginal cost equals the combined marginal revenue.

      D   uses cost-based pricing for the main product and the by-product.   [1½]

9.5   (i)   Draw a graph showing the four stages of the product life cycle.   [2]

Exam style

      (ii) Describe the stages of the life cycle of basic mobile phones.   [4]

      (iii) Explain the pricing policies of the basic mobile phone companies during the cycle, including the later introduction of more sophisticated smart phones.   [4]
                                                                                  [Total 10]

The solutions start on the next page so that you can
separate the questions and solutions.

ᴬᴮᶜ **Module 9 Solutions**

9.1   *Limit pricing* is a pricing strategy where an existing firm deliberately keeps its prices below the
      level that would maximise profits in the short run so as to deter new entrants to the market.   [1]

      Although the firm's profits may be reduced in the short run, this strategy may lead to greater
      long-run profits if new entrants are successfully deterred and competition thereby reduced.   [1]

      This approach relies on the existing firm having lower average costs than potential new entrants,
      eg due to economies of scale, or because the existing firm already employs the most efficient
      resources.   [1]

      Diagram
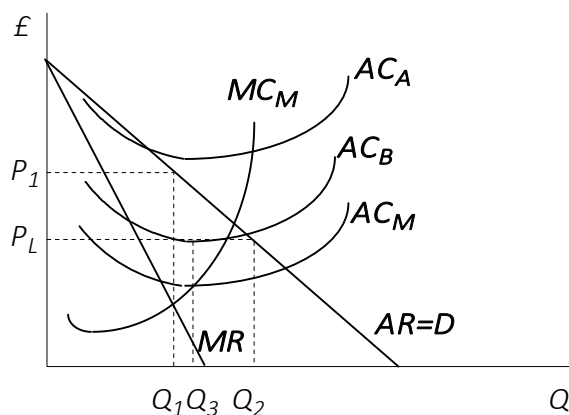
      [1 for a suitable diagram]

      The short-run profit-maximising output level for the existing monopolist (*M*) is at output level Q_1
      (where $MR = MC$) and at this quantity, it would charge price P_1.   [½]

      A potential entrant (Firm A) would not be a threat to the existing monopolist because it could not
      earn supernormal profits by charging P_1.   [½]

      However, another potential entrant (Firm B) would be a threat as it could charge P_1 and still make
      a supernormal profit.   [½]

      If the existing firm sets the price at P_L (and sells Q_2), then Firm B would not be able to make a
      profit. This is because if it did enter the market and produce Q_3, then the price would fall below P_L
      and the new entrant would make a loss and leave.   [1]

      [Maximum 5]

9.2   *Third-degree price discrimination* is the practice of dividing consumers into different groups based
      on some characteristic that is relatively easy to observe …   [½]

      …and informative about how much consumers are willing to pay.   [½]

      The firm then charges a different price to consumers in different groups, but the same price to all
      the consumers within a group.   [½]

In order to practise third-degree price discrimination:

- The firm must have some control over the price it sets, *ie* it must face a downward-sloping demand curve. [½]

- It must not be possible for consumers to buy a good and then to resell it on to other consumers at a higher price. [½]

- The elasticity of demand for the good must differ between different groups of consumers. [½]

- It must be possible (and not prohibitively expensive) to identify the different groups of consumers and their different elasticities of demand. [½]

- It must be possible to find a characteristic to differentiate between groups of consumers that is:

    – relatively easy to observe [½]

    – informative about consumers' willingness to pay [½]

    – legal [½]

    – acceptable to the consumers. [½]

[Maximum 4]

9.3   *This question is Subject CT7, September 2011, Question 31.*

(i)   ***Diagram for third-degree price discrimination***

Market A   Market B   Total (Market A + Market B)
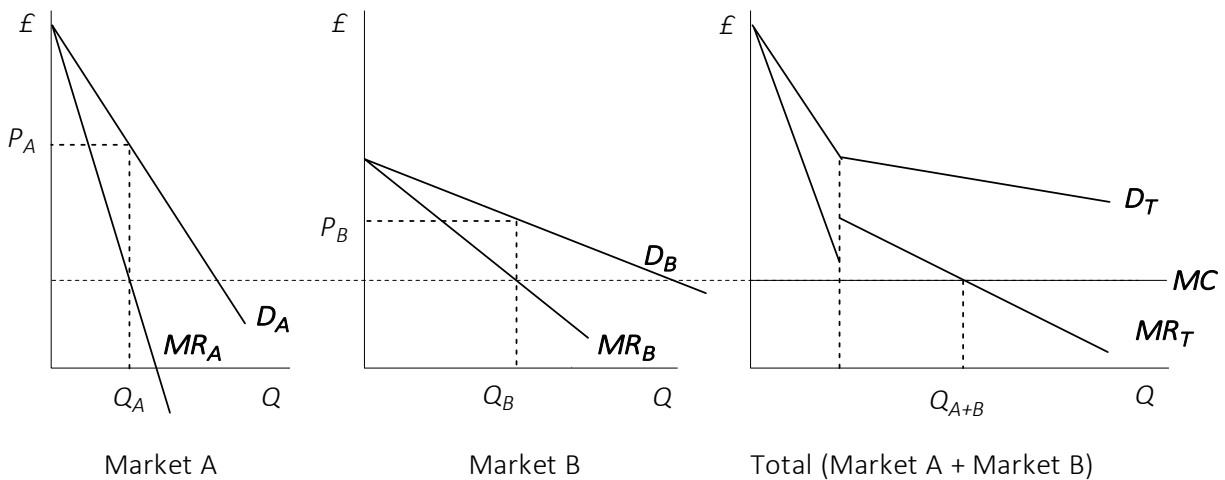
[3 for a suitable diagram]

(ii)   ***Examples of second- and third-degree price discrimination***

Examples of second-degree price discrimination include:

- electricity (and other utilities companies), which may charge a higher price for the first *x* kilowatts and then a much lower rate for additional kilowatts

- 'buy-one-get-one-free' and '3 for the price of 2' offers

- the use of coupons / vouchers to buy goods and services for a lower price

- 'versioning', whereby firms sell different versions of the same core product.

[1 for a suitable example]

Examples of third-degree price discrimination include:

- different-priced seats on buses / in cinemas for adults, children and pensioners

- goods and services that are priced differently depending on when they are used and who is using the service, *eg* peak / off-peak rail fares for commuters / leisure travellers

- different-priced admission to tourist sites for locals and foreign visitors

- different prices charged for the same product in different locations (assuming the costs of provision are identical), *eg* medicine / drugs

- different-priced software packages to certain groups of people, *eg* employees of educational institutions

- different-priced educational material, *eg* academic journals, to individuals and institutions

- different-priced packages for new (rather than existing) customers.

[1 for a suitable example]
[Total 2]

9.4   *This question is Subject CT7, September 2010, Question 2.*

Option C.

Profit is maximised when marginal cost is equal to marginal revenue.

A *by-product* is good or a service that is produced as a result of producing another good or service. If a firm is producing a main product and a by-product, it will maximise profits at the combined output where:

combined *MC* = combined *MR*

The answer is therefore Option C. Having decided on the combined output and split this into the individual outputs of each product, the firm will then use the individual demand curves to determine the price to be charged for the main product and the by-product.

Option B suggests using the 'marginal rule' for the by-product separately. However, production of the by-product is inextricably linked with the production of the main product, so it is not possible to sell more of the by-product than the amount produced in the course of producing the desired amount of the main product, and selling less than the amount produced could be very costly and wasteful. By considering the profitability of the combined output, a firm might produce more of the main product than it otherwise would, because the profit from the by-product more than makes up for the lower profit on the main product.

Options A and D do not determine a profit-maximising position.   [1½]

9.5   *This question is Subject CT7, September 2010, Question 31 (amended).*

(i)   ***The product life cycle***
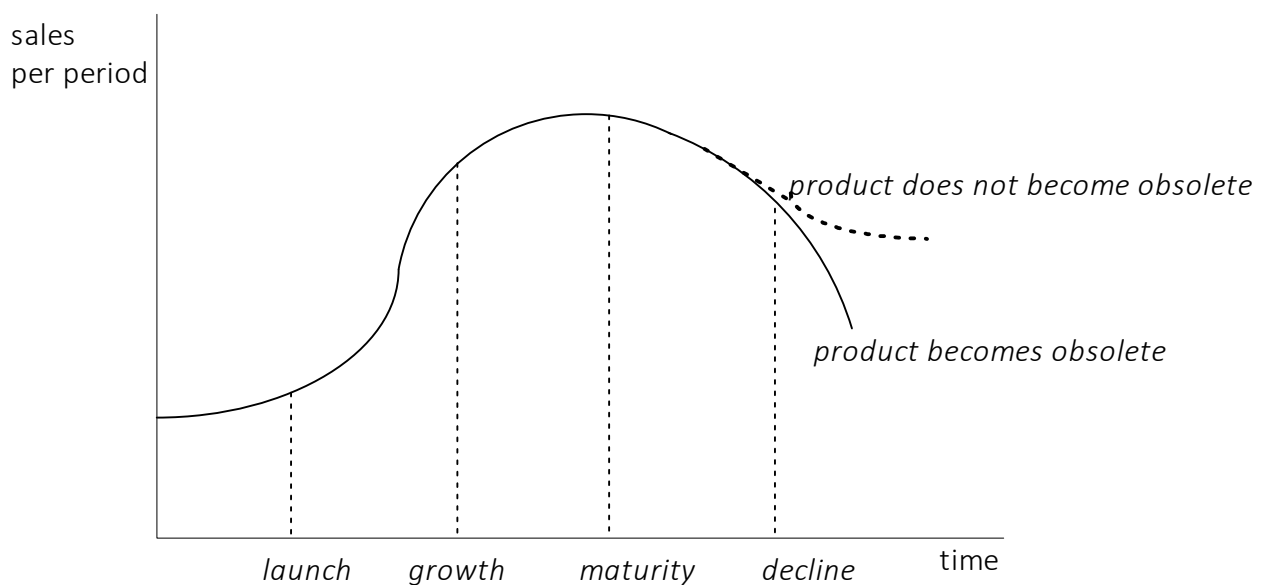
[2 for a suitable diagram]

(ii)   ***The product life cycle of basic mobile phones***

Launch: There are few firms in the mobile phone market. Adventurous consumers ('early adopters') will buy the first mobile phones.   [1]

Growth: There is rapid sales growth as early problems are ironed out and customers gain confidence in mobile phones. Firms make supernormal profit and therefore new firms are attracted into the market.   [1]

Maturity: The growth in sales slows down and the market becomes saturated. Non-primary uses for mobile phones, *eg* texting, might be promoted to extend the life of the phone. Competition intensifies and firms engage in promotions and offer discounts.   [1]

Decline: Sales decline and profitability declines. Further promotions and discounts are offered. Rejuvenation policies may be introduced to extend the life of the phone, *eg* new versions. However, the life of the basic mobile phone might be over and more sophisticated phones might take over.   [1]

                                                                                    [Total 4]

(iii)   ***Pricing policies during the product life cycle of basic mobile phones***

Launch: The price was high as there was little competition and the early adopters had a relatively inelastic demand for the product.   [1]

Growth: Although new firms entered the market, demand was growing rapidly and prices remained high. In typical oligopoly fashion, price competition was weak and firms tended to compete in other ways, *eg* minor differences in the product, advertising, various payment schemes.   [1]

Maturity: Competition intensified and pricing became more aggressive.   [1]

Decline: This is probably where the basic mobile phone is now, as more people are buying the new generation mobile phone, the smart phone. Further price reductions on the basic mobile phones may occur in order to retain some customers, although companies that also produce the smart phone might aim to reduce the price differential between the smart phone and the basic phone in order to make the smart phone more attractive.   [1]

[Total 4]

End of Part 1

What next?

1.   Briefly **review** the key areas of Part 1.

2.   Ensure you have attempted some of the **Practice Questions** at the end of each module in Part 1. If you don't have time to do them all, you could save the remainder for use as part of your revision.

3.   Attempt **Assignment X1**.

Time to consider …

… 'learning and revision' products

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10

Market failure and government intervention

Syllabus objectives

3.1   Discuss the reasons for government intervention in the market.

   1.   Explain and discuss the extent to which businesses meet the interests of consumers and society in general.

   2.   Explain in what sense perfect markets are 'socially efficient' and why most markets fail to achieve social efficiency.

   3.   Explain why externalities can lead to inefficient markets.

   4.   Describes the ways in which governments intervene in markets in order to influence business behaviour and explain the drawbacks of such intervention.

   5.   Explain and discuss whether taxation or regulation could be more useful in correcting markets' shortcomings.

3.2   Discuss the relationship between the government and the individual firm.

   1.   Describe the main targets of 'competition policy' and explain the extent to which it is effective.

   2.   Explain why a free market fails to achieve the optimal amount of research and development.

   3.   Describe the various forms of intervention that the government can undertake in order to encourage technological advance and innovation.

Core Reading

Chapter 12 (Sections 1, 2, 3 and 5)   *Pages 347–378, 386–389*
                    (excluding the intermediate analysis of social efficiency on pages 353–355)

Chapter 14 (Section 1)   *Pages 422–432*

From the textbook:

> *Economics for Business. Sloman, J., Garratt, D., Guest, J., Jones, E. 7th ed. Pearson 2016, which students can access via the ebook (MyiLibrary) service using their Athens password: http://lib.myilibrary.com?id=926627&ref=Athens*

Chapter 21 (Section 2, introduction, technological change and market failure and forms of intervention)   *Pages 376–377*

0   Introduction

The government intervenes in the market economy because the market 'fails' to achieve a satisfactory allocation of resources, or, more specifically, social efficiency. In this module, we:

- examine the reasons for market failure (which include externalities and imperfect markets) and the policies that could be implemented by governments to remedy these problems (further details of these policies will be provided in later modules on supply-side and demand-management policies)

- consider the case for limiting such government intervention

- look specifically at government intervention to increase competition within a market, and to achieve an optimal level of research and development.

Note that the material covered in Sections 1 to 4 of this module was examined frequently in Subject CT7.

1 Efficiency under perfect competition

1.1 What's included in this section

- Social efficiency: 'Pareto optimality'

- The simple analysis of social efficiency: marginal benefit and marginal cost

- Achieving social efficiency through the market

- Interdependence, efficiency and the 'invisible hand': the simple analysis of general equilibrium

1.2 Guidance

One of the key concepts in this section is that of social efficiency (a situation where it is impossible to make anyone better off without making someone else worse off). We have actually already met this concept in the context of output, so this is nothing new. Note that:

- In Module 7, we discussed the optimal level of output occurring where $P = MC$, and this is true in the absence of externalities.

- In this section, we use a more general condition that applies even where externalities exist: that marginal social benefit (MSB) is equal to the marginal social cost (MSC).

Note that the section on intermediate analysis of social efficiency is not part of the Core Reading and so is not examinable.

1.3 Reading

Task	√when completed
Read Chapter 12, pages 348–356, excluding the material on intermediate analysis of social efficiency on pages 353–355.	☐

1.4   Checklist

Task	√ *when completed*
Ensure that you can:	
• define the following key terms:	
– Pareto improvement	☐
– Pareto optimality	☐
– social efficiency	☐
– rational economic behaviour	☐
– private efficiency	☐
– externalities	☐
– general equilibrium	☐
– total producer surplus	☐
– total (private) surplus	☐
– total social surplus	☐
• explain why private efficiency occurs where $MB \text{ (or } MU) = MC$	☐
• explain why social efficiency occurs where $MSB = MSC$	☐
• state the two conditions for private efficiency to result in social efficiency	☐
• explain and illustrate how perfect competition achieves social efficiency in the absence of externalities	☐
• explain how, following an increase in demand, the market economy (operating like an invisible hand) through a series of interrelated markets reallocates resources to restore social efficiency.	☐

1.5   Questions

Question

Discuss the desirability of achieving social efficiency.

Solution

Social efficiency is a situation of Pareto optimality, *ie* a situation in which it is impossible to make anyone better off without making someone else worse off. This in itself is desirable.

However, Pareto optimality is a necessary but not a sufficient condition for an ideal allocation of resources. This is because it ignores the fairness of the distribution of income. For example, situations of equal and highly unequal distributions of income could both be Pareto optimal, but arguably the former is more socially desirable.

Question

If the marginal social benefit exceeds the marginal social cost then:

A   an increase in output will increase welfare.
B   a decrease in output will increase welfare.
C   welfare cannot be increased.
D   it is impossible to say what will happen to welfare without further information.

Solution

Option A. If $MSB > MSC$, then the addition to total benefit from the extra unit of output exceeds the addition to total cost from the extra unit of output, so that total welfare will increase from producing the additional unit of output.

Question

Define:

(i)   consumer surplus

(ii)   producer surplus.

Solution

(i)   ***Consumer surplus***

Consumer surplus is the surplus of satisfaction over that which consumers have paid for, *ie* total utility *less* total expenditure.

(ii)   ***Producer surplus***

Producer surplus is the surplus revenue received over the minimum required to supply the good. In the short run, this is total revenue *less* total variable costs.

Question

Define *total private surplus* and illustrate how this is maximised under perfect competition.

Solution

Total private surplus is total consumer surplus plus total producer surplus.
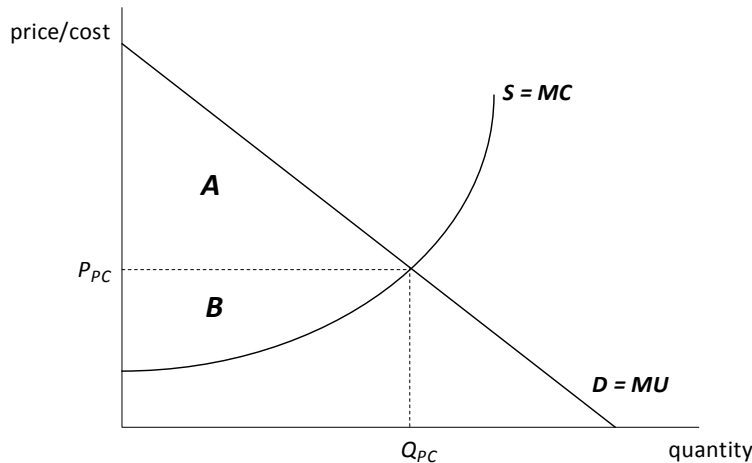
Individual consumer surplus is the excess of utility derived from consuming a unit of output over the price paid for it. Total consumer surplus is given by the area below the *D* curve but above the price each consumer pays (P_{PC}) up to the quantity produced (Q_{PC}), *ie* the area *A*.

Total producer surplus is total revenue (represented by $Q_{PC} \times P_{PC}$) minus total variable costs (the area under the *MC* curve up to Q_{PC}), *ie* the area *B*.

Under perfect competition (PC), the output level will be where *P = MU* (*ie* Q_{PC}), at which point total private surplus is maximised. At lower output levels, $MU > MC$, so total consumer and producer surplus would increase with additional output. At higher output levels, $MU < MC$, so total surplus would increase with reduced output.

2　The case for government intervention

2.1　What's included in this section

- Externalities

- Public goods

- Market power

- Other market failures

2.2　Guidance

While this section is titled 'The case for government intervention', it actually simply contains a description of the causes of market failure, *ie* the failure of a free market (without government intervention) to achieve social efficiency.

The examination will probably test an *understanding* of these key causes (such as externalities and public goods), the *knowledge* of real world examples of them, and an *ability to draw relevant diagrams* to illustrate the market failure.

Being familiar with examples of each category should help to both understand and remember the theory. Box 12.1 discusses whether some aspects of policing (usually regarded as a public good) could be provided privately.

Note that there is an error in the textbook in the labelling of Figure 12.7. The top green line in the diagram should be labelled '$MSB = MPB + MEB_C$', *ie* it should *add on* the marginal external benefits of consumption (not subtract them).

2.3　Reading

Task	*√when completed*
Read Chapter 12, pages 356–369.	☐

2.4　Checklist

Task	*√when completed*
Ensure that you can: • list the main types of market failure	☐
• explain how each type of market failure causes an unsatisfactory (suboptimal or inequitable) allocation of resources.	☐

Task	√ *when completed*

Continued

Ensure that you can:

- define the following key terms:
    - external costs   ☐
    - external benefits   ☐
    - social cost   ☐
    - social benefit   ☐
    - socially optimal output   ☐
    - social surplus   ☐
    - deadweight welfare loss from externalities   ☐
    - non-rivalry   ☐
    - non-excludability   ☐
    - public good   ☐
    - pure public good   ☐
    - impure public good   ☐
    - club good   ☐
    - common good or resource   ☐
    - tragedy of the commons   ☐
    - free-rider problem   ☐
    - deadweight welfare loss of monopoly   ☐
    - merit goods   ☐

- give examples of:
    - external costs and benefits of production   ☐
    - external costs and benefits of consumption   ☐
    - public goods (including pure and impure)   ☐
    - club goods   ☐
    - common resources   ☐
    - merit goods   ☐

- draw diagrams to illustrate the effects of:
    - negative externalities in production   ☐
    - positive externalities in production   ☐
    - negative externalities in consumption   ☐
    - positive externalities in consumption   ☐
    - the efficient output of a pure public good   ☐
    - the deadweight welfare loss from monopoly.   ☐

2.5   Questions

Question

Which of these would NOT be included in the social costs of the petroleum industry?

A   the cost of treating illnesses caused by car exhaust fumes
B   surplus profits of oil suppliers during a fuel shortage
C   the cost of raising capital for investment in oil exploration
D   traffic hazards caused by transporting inflammable materials in petrol tankers

Solution

Option B. The social costs include the private costs (*eg* wages, raw materials, admin costs, finance costs (Option C)) plus the external costs (*ie* the costs imposed on third parties, such as health effects (Option A) and accidents and disruption (Option D)). Surplus profits, *ie* supernormal profits (Option B), are not included in private costs.

Question

Draw a diagram to illustrate the level of consumption and the deadweight welfare loss to society arising when there is a negative externality in consumption.

Solution
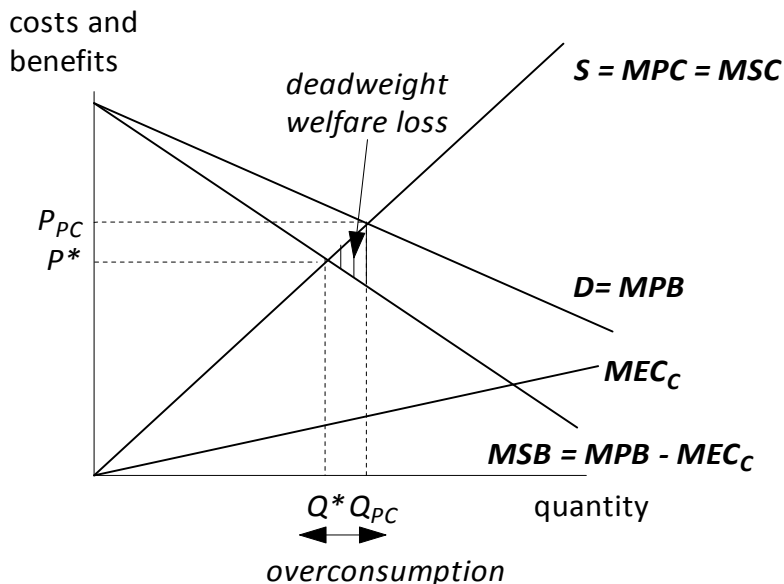
Note that Q_{PC} is the level of consumption in a free (perfectly competitive) market, while Q^* is the socially efficient output level. P^* would be the price if MSB was also MPB.

Question

Suggest the external costs and/or benefits of the following activities:

(i)   the production of chemicals that causes air and water pollution

(ii)   using car transport

(iii)   the building of a new architect-designed office block on a rubbish tip

(iv)   increasing the school-leaving age from 16 to 18.

Solution

(i)   *External costs and benefits of chemical production*

The air pollution could have an adverse effect on:

- health (*eg* asthma) and therefore impose costs on the sufferers and the health service

- enjoyment of outdoor activities, *eg* football

- drying washing outside (this was a serious problem near the steel works in South Wales).

The water pollution could have an adverse effect on:

- the health of fish, animals and birds that live in or by the water

- the health and enjoyment of those people who use the water, *eg* anglers, windsurfers, sailors

- the jobs of those who depend on clean water, *eg* fishermen, those in the tourist trade.

External benefits may occur if:

- this firm's research and development enables other firms to improve their products or processes

- the firm's products improve the health of its customers and thereby improve the productivity of the nation.

(ii)   *External costs and benefits of car usage*

Possible external costs include:

- the effects of air and noise pollution on health (and therefore on the health service) and on enjoyment of the environment (particularly for those living near busy roads)

- the effects of pollution on global warming and therefore on the planet

- the effect of accidents in terms of lost output and pain and distress

- the effect of congestion in terms of wasted time and increased costs for other motorists (increased fuel consumption and wear and tear when in traffic jams).

Possible external benefits:

- more space in buses and trains.

(iii) *External benefits and costs of the new office block*

Possible external benefits:

- greater enjoyment of the environment for residents

- increase in trade for local business (from the new office workers)

- more businesses might be attracted to the area

- tourists might be attracted to the area.

Possible external costs:

- pollution created in building the new office block

- may not be pleasant for residents if it's not to their taste

- extra travelling to the new rubbish tip.

(iv) *External benefits and costs from raising the school-leaving age from 16 to 18*

Possible external benefits:

- better educated workforce, which will increase economic growth in the long term

- better educated citizens who feel more confident about participating in public life (*eg* voting, standing for election), which might improve the quality of the government and the quality of life

- better educated individuals who have a wider range of interests and greater enjoyment of life ($-$ or perhaps ignorance is bliss).

Possible external costs:

- reduction in output in the short run as a result of the smaller workforce

- disruption to other students caused by students who don't want to be there.

In this case, the consumers of education are not directly paying for it. Some taxpayers may feel no benefit from this service and would prefer their taxes to be used elsewhere. Some direct beneficiaries, *ie* students, might undervalue the service and might not make the most of the opportunities given to them $-$ in fact, some, whose careers and lifestyle are not dependent on academic success, might feel that the extra two years are wasteful and distressing.

Question

(i) Draw a diagram to show a profit-maximising monopoly in long-run equilibrium.

(ii) Use this diagram to:

    (a) identify 'deadweight welfare loss'

    (b) explain why this firm will produce a less than socially optimal level of output.

Solution

(i) *Profit-maximising monopoly in long-run equilibrium*

The monopolist produces a quantity of Q_1 at price p_1.
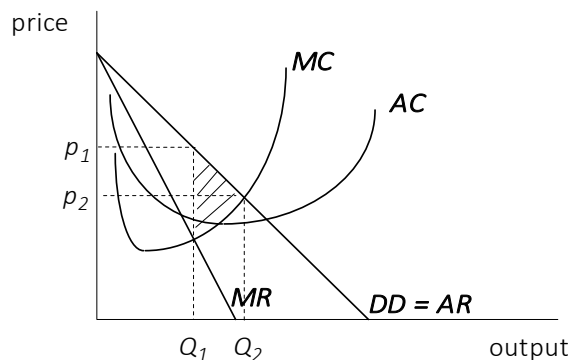
(ii)(a) *Deadweight welfare loss*

The *deadweight welfare loss* is the loss of consumer surplus and producer surplus resulting from the monopolist producing a lower output compared with an industry supplied by perfect competition. In the diagram above, it is the shaded area bounded by the *AR* curve, the *MC* curve and Q_1.

(ii)(b) *Why the firm will produce a less than socially optimal level of output*

The monopoly chooses its output level by aiming to *maximise its profits*. This occurs where marginal revenue is equal to marginal cost (*ie* where the *MR* and *MC* curves intersect), *ie* at quantity Q_1 and price p_1 on the diagram in part (i).

The *socially optimal level of output* is the output level at which the price (or average revenue) is equal to marginal cost, *ie* where the *AR* and *MC* curves intersect. This occurs at quantity Q_2 and price p_2 on the diagram in part (i).

If the price, which reflects marginal utility, is greater than the marginal cost (as is the case between Q_1 and Q_2 in the diagram in part (i)), then increasing output would also increase welfare.

Note that this assumes there are no other causes of market failure present, eg external costs and benefits.

Question

Classify the following as pure public goods, club goods, common resources or none of these.

Also, indicate which may be considered to be merit goods:

(a)   clean air

(b)   clean water

(c)   wild fishing

(d)   private parks

(e)   public parks

(f)   pavements in village locations

(g)   cycle paths in rush hour

(h)   toll roads during the night

(i)   public toilets at festivals

(j)   street lighting

(k)   museums

(l)   lighthouses

(m)   the army

(n)   parliament

(o)   pensions

(p)   healthcare

(q)   education

(r)   insurance for unemployment and sickness

(s)   pay-per-view TV broadcasting

(t)   CD player

(u)   chocolate.

Solution

Public goods – *non-rival and non-excludable*:

(e)   public parks

(f)   pavements in village locations

(j)   street lighting

(l)   lighthouses

(m)   the army

(n)   parliament

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Club goods – *excludable but non-rival*:

(d)   private parks

(h)   toll roads during the night

(k)   museums

(s)   pay-per-view TV broadcasting

Common resources – *rival but non-excludable*:

(a)   clean air

(b)   clean water

(c)   wild fishing

(g)   cycle paths in rush hour

(i)   public toilets at festivals

None of the above:

(o)   pensions

(p)   healthcare

(q)   education

(r)   insurance for unemployment and sickness

(t)   CD player

(u)   chocolate

Merit goods – *benefits are not fully appreciated by the user and they confer external benefits*:

(b)   clean water (this improves hygiene and health)

(d)(e) private and public parks (these improve the environment and attract tourists)

(k)   museums (they are educational, tend to lead to enriched local culture and attract tourists)

(o)   pensions (they remove the burden from society of financing retirement)

(p)   healthcare (this improves general levels of health across the population and increases productivity)

(q)   education (well-educated individuals tend to contribute more to society)

(r)   insurance for unemployment and sickness (similar to pensions)

Question

The principle of non-rivalry applied to public goods means that:

A   the production of public goods involves increasing marginal costs.
B   public goods must be financed by income tax.
C   the opportunity cost of provision is a positive and constant value.
D   no extra resources will be consumed when marginal consumption takes place.

Solution

Option D. Non-rivalry means that one person's consumption does not impede another person's consumption. Unlike private goods, people do not compete with each other for a public good. Therefore, once it is provided for one person, no extra resources are needed to provide it for another. For example, once street lighting is provided, there is no extra cost when an additional person walks down the street.

3   Forms of government intervention

3.1   What's included in this section

- Taxes and subsidies

- Changes in property rights

- Laws prohibiting or regulating undesirable structures or behaviour

- Regulatory bodies

- Price controls

- Provision of information

- The direct provision of goods and services

- Public ownership

3.2   Guidance

It is important to understand both the main sources of market failure (from the previous section) and the policies that could be implemented to deal with each, including their pros and cons (from this section).

Government provision of health and social care – and in particular the National Health Service that exists in the UK – is often used to illustrate sources of market failure and how they are dealt with. Box 12.3 is an example of this.

Box 12.4 contains a useful diagram illustrating the deadweight loss from a tax on goods and services assuming there is no market failure.

Note that price controls were studied in Module 4.

3.3   Reading

Task	√when completed
Read Chapter 12, pages 369–378.	☐

3.4   Checklist

Task	√ *when completed*
Ensure that you can:	
• define the following key terms:	
– problem of the second best	☐
– first-best solution	☐
– second-best solution	☐
– Pigouvian tax (or subsidy).	☐
– government surplus (from a tax on a good)	☐
– excess burden (of a tax on a good)	☐
– Coase theorem	☐
• list the main types of government intervention	☐
• explain how each type of intervention aims to correct market failure	☐
• discuss the relative merits of each type of government intervention	☐
• list the four reasons why the government provides health and education (which are not public goods) for free or well below cost	☐
• draw diagrams to illustrate:	
– Pigouvian taxes and subsidies for both perfect competition and where market power exists	☐
– the deadweight welfare loss from a tax on a good assuming there is no market failure.	☐

3.5   Questions

Question

List the different types of government intervention.

Solution

- per unit taxes / subsidies

- lump sum taxes (with our without subsidies to increase output)

- changes in property rights

- laws prohibiting undesirable behaviour

- laws prohibiting excessive market power

- laws on the provision of information by firms

- regulatory bodies

- price controls

- the provision of information by the government

- direct provision of goods and services

- public ownership

Question

The production of a good results in a negative externality. It is likely that there will be an improvement in economic welfare if the government:

A   gives the producer a subsidy that reflects the marginal benefit derived from the consumption of the good.

B   gives the producer a subsidy that reflects the marginal cost of the externality.

C   eliminates any restrictions on output to allow market forces to work.

D   imposes a tax on the producer that reflects the marginal cost of the externality.

Solution

Option D. The existence of a negative production externality (an external cost) means that $MSC > MPC$. This implies that the profit-maximising level of output (determined on the basis of *private* costs and benefits alone) will be in excess of the socially optimal output level. To reduce output to the socially optimal output level, the external cost will need to be internalised, *ie* the producer will have to absorb this external cost. Therefore, a tax needs to be imposed that is equal to the marginal external cost at the socially efficient output level.

4   Government failure and the case for the market

4.1   What's included in this section

- Drawbacks of government intervention

- Advantages of the free market

- Should there be more or less intervention in the market?

4.2   Guidance

The examination will probably test an *ability to evaluate* the case for and against government intervention.

Note that the reading includes Box 12.7, which was also part of the reading for Module 2. This box describes the views of economists belonging to the Austrian school. They are ardent supporters of the free market for its ability to co-ordinate the decisions of consumers and producers without the intervention of bureaucrats, for its motivating force and the liberties it offers.

4.3   Reading

Task	√*when completed*
Read Chapter 12, pages 386–389.	☐

4.4   Checklist

Task	√*when completed*
Ensure that you can:	
• describe the problems caused by government intervention in a free market	☐
• describe the advantages of the free market	☐
• discuss the case for more or less government intervention.	☐

4.5   Questions

Question

Which of the following is NOT an advantage of the free market?

A   automatic adjustments are made to changes in demand and supply
B   competition between firms prevents high profits being earned
C   individuals are free to make economic choices
D   material incentives encourage risk-taking and innovation

Solution

Option B. Monopolies and oligopolies can form in a free market and, since barriers to entry prevent new firms entering the market, high levels of supernormal profits can be earned in the long run.

Question

Describe the possible drawbacks of government intervention in the market.

Solution

1.   *Shortages and surpluses*

If the government thinks that the market price of a product is too high, it might introduce a price ceiling below this, but this would result in excess demand, *ie* a shortage. As a result, some rationing system would have to be introduced (*eg* queuing, waiting lists, ration coupons), and this would have to be policed to avoid the development of an illegal (or shadow or underground) market.

If the government thinks that the market price is too low, it might introduce a price floor above this, but this would result in excess supply, *ie* a surplus. To guarantee the price, the government might buy up the surplus, which could be expensive. Furthermore, if surpluses were produced year after year, the surplus stock would eventually have to be sold on the world market at the lower world price, or possibly destroyed.

2.   *Poor information*

Consumers and producers make suboptimal decisions because of ignorance. Similarly, the failure of government to achieve its intended aims can result from ignorance. If the government strives to maximise welfare, it needs to know society's utility function and its cost function. It is likely to be unaware of society's wishes and this ignorance is compounded by a lack of information on externalities. This lack of complete information might cause the government to introduce second-best solutions, *eg* restrictions on imports to protect a declining industry rather than retraining the workers with the skills needed in other (growing) industries.

3.   *Bureaucracy and inefficiency*

Government intervention requires a large team of talented civil servants (*eg* economists, lawyers, administrative staff), as well as sophisticated and expensive equipment and technology. If the intervention brings about a better allocation of resources (*eg* reduced pollution) then such intervention would be regarded as a good use of resources. Nevertheless, critics of intervention suggest that these resources could be used more productively elsewhere.

4.   *Loss of market incentives*

Government intervention might weaken market incentives and result in lower efficiency. For example, if the government rescues banks when they run short of funds rather than allow them to fall into bankruptcy, the problem of moral hazard could be created as banks adopt riskier lending strategies in the belief that they will always be rescued. Similarly, subsidies might allow inefficient firms to survive, and welfare payments might discourage people from working.

5.   *Shifts in government policy*

Frequent changes in government policy (*eg* taxation and government spending) cause uncertainty that makes it very difficult for firms to plan for the future. Some firms may be very dependent on a particular policy, *eg* a lower corporate tax rate in depressed regions, and may be severely affected if the policy is changed or removed.

6.   *Lack of freedom of choice*

Intervention by the government removes some element of freedom of choice in making individual economic decisions. For example, if taxation increases to pay for increased government spending on infrastructure projects, individuals have less disposable income to spend on what they would like to buy.

7.   *Welfare loss*

The imposition of taxation on goods results in higher prices for consumers, lower prices for producers and lower output of these goods. Consumer surplus falls and producer surplus falls. This is partly made up by the government surplus, *ie* the tax revenue, but there is a net welfare loss (which is known as the 'excess burden' of tax). However, this standard analysis assumes that the socially optimal output level was produced prior to the imposition of the tax. In fact, the tax might have been imposed to correct market failure. If, for example, the product was a pollutant, then the overproduction prior to the tax could be corrected by the tax.

Note that this final point was covered in Section 3 of this module.

5 Competition policy

5.1 What's included in this section

- Competition, monopoly and the public interest

- The targets of competition policy

- Competition policy in the European Union

- UK competition policy

- Assessment of competition policy

5.2 Guidance

The exam will probably test an ability to *explain* how firms can use their market power to the detriment of consumers.

It is important to be able to give lots of examples of anti-competitive practices and to be able to explain how the three areas of competition policy can make markets more competitive. Such examples may be found in the sections on competition policy in the European Union and the UK.

Note that this material was examined infrequently in Subject CT7 and the questions that were asked did not require a detailed knowledge of EU and UK legislation.

5.3 Reading

Task	√when completed
Read Chapter 14, pages 422–432.	☐

5.4 Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– exploitative abuse	☐
– exclusionary abuses	☐
– tying	☐
– margin squeeze	☐
– vertical restraints	☐
– cross-subsidise	☐
– restrictive practices	☐
– bid rigging.	☐

Task	√*when completed*
Continued	
Ensure that you can:	
• discuss how the use of market power may be against the public interest and how it might be beneficial	☐
• describe the actions that can be taken in the UK if a monopoly is responsible for carrying out exploitative or exclusionary abuses	☐
• describe the actions that can be taken in the UK if a firm is responsible for anti-competitive practices	☐
• describe the three targets of competition policy	☐
• give examples of exclusionary abuses	☐
• give examples of restrictive practices	☐
• state three possible decisions that may be reached following merger investigations in the UK	☐
• discuss the effectiveness of competition policy.	☐

5.5   Questions

Question

Which of the following is the definition of exploitative abuse?

A   a business practice that directly harms the customer

B   a business practice that limits or prevents effective competition from either actual or potential rivals

C   a practice where two or more firms agree to adopt common practices to restrict competition

D   a practice where two or more firms secretly agree on the prices they will tender for a contract

Solution

Option A. Options B, C and D are definitions of exclusionary abuses, restrictive practices and bid rigging respectively.

Question

A monopoly firm has a position of market power and may use discriminatory pricing to generate high profits or to exclude competitors.

(i)   Outline why it might choose *not* to fully exploit its position of market power.

(ii)   Explain whether it should use high or low prices in each case.

Solution

(i)   ***Choice not to exploit market power***

A monopoly could use its market power to charge high prices and make supernormal profits. However, new entrants may be encouraged into the market if the potential profits are high enough to overcome any barriers to entry. Excessive profits may also result in closer scrutiny by the government. So lower prices may actually lead to higher long-term profits for monopolies.

In addition, profit maximisation is not the aim of all organisations, *eg* state-owned companies and not-for-profit companies.

(ii)   ***High or low prices?***

If practising price discrimination, a monopoly will maximise its profits by charging different prices for the same product according to the customers' willingness and ability to pay. For example, higher prices will be charged to groups that have a more inelastic demand.

However, by charging low prices to some of the monopoly's customers, perhaps those in a particular location, it will prevent competitors entering the market as they could only obtain market share on loss-making terms.

Question

A group of insurance companies has agreed to fix a maximum rate of commission that it will pay to intermediaries who sell their policies. The government is considering whether this constitutes an anti-competitive practice.

Discuss whether the government should allow this maximum commission agreement to continue.

Solution

Negative aspects of agreement

The imposition of a maximum level of commission reduces the ability of intermediaries to compete on the commission terms they offer to policyholders. They can charge less than the maximum rate, but the difference between the highest and lowest commission rates is likely to be smaller than before.

Intermediaries may consider the terms of the agreement unfair as it reduces the maximum amount of income they can receive for each sale.

Positive aspects of agreement

Commission rates are not fixed. Intermediaries are free to compete by offering to take less commission than the maximum.

Consumers benefit from a cap on the amount of commission that must be loaded into their premiums.

In the absence of such an agreement, there is a danger that intermediaries will be tempted to sell the contract with the highest commission rather than the contract most appropriate to the policyholder. This agreement stops insurers from raising commissions to intermediaries as a marketing tool to sell more policies.

The insurers who have signed the agreement benefit from a cap on their costs.

Question

Which of the following is NOT an example of an abuse of market power performed by a monopoly?

A   paying unfairly low prices to suppliers
B   discriminatory pricing to exclude competitors
C   predatory pricing to drive competitors out of business
D   bid rigging

Solution

Option D. Bid rigging requires *two or more* firms to secretly agree the prices they will tender for a contract.

6   Policies towards research and development (R&D)

6.1   What's included in this section

- Technological change and market failure

- Forms of intervention

6.2   Guidance

This is a short section, but it contains some useful information on the stages of technological change, the reasons markets fail to encourage sufficient R&D, and the main forms of government intervention.

It is worth being able to link each reason for a market failure to produce sufficient R&D with the appropriate form of government intervention to correct that failure.

Don't forget to use the alternative textbook for this section.

6.3   Reading

Task	√*when completed*
Read Economics for Business, Chapter 21, pages 376–377 of Section 2. *(See front page for access details.)*	☐

6.4   Checklist

Task	√*when completed*
Ensure that you can:	
• describe the three stages of technological change	☐
• explain four reasons why market forces may fail to encourage sufficient R&D	☐
• describe six forms of government intervention	☐
• define the following key term: – technology policy.	☐

6.5   Questions

Question

Outline the main benefits to firms of R&D expenditure.

Solution

R&D should lead to an improvement in the quality of goods and/or an increase in productivity and therefore a reduction in the cost of production (and hence lower prices). These effects should both increase a firm's profits and hence its share price.

High levels of R&D spending may also reduce the number of competitors, as some existing firms will not be able to keep up and it will be too expensive for new firms to close the technology gap on established firms.

Question

Describe briefly the three stages of technological change.

Solution

Invention – the development of new ideas and new products.

Innovation – putting new ideas into practice (and firms might gain a commercial advantage).

Diffusion – the spread of ideas to other organisations which may copy or adapt the original idea.

Question

(i)   Define the term 'patent'.

(ii)   Give an advantage and a disadvantage of using patents as part of a government's technology policy.

Solution

(i)   ***Definition of a patent***

A patent is a temporary legal monopoly awarded to an inventor who registers an invention.

(ii)   ***Advantage and disadvantage of patents***

Firms will be more likely to conduct R&D because any new ideas they produce cannot be copied by competitors.

The inventing firm can then fully exploit the new idea during the period of the patent.

The diffusion of ideas may be slowed as firms will not be able to directly copy a patented idea for a period of time.

Question

Increasing the legal length of time for patents to operate may:

I   increase the amount of research and development carried out.
II   increase the social costs arising from monopoly.
III   reduce profits for innovators.

A   I and II
B   II and III
C   I only
D   III only

Solution

Option A. Increasing the time a patent is in force increases the time in which the inventor can exploit the new idea before other firms are allowed to copy it. This should increase the inventor's profits and so make it more worthwhile to conduct research. However, the use of patents creates a monopoly to the detriment of consumers.

The practice questions start on the next page so that you can
keep the practice questions and solutions together for revision purposes.

Module 10 Practice Questions

10.1 (i)   Explain what is meant by the Pareto optimum (or socially efficient) level of output and
explain the condition for Pareto optimality.   [4]

(ii) Explain whether or not a monopolist produces at the Pareto optimum level of output.   [2]

[Total 6]

10.2 (i)   Define and give an example of an external benefit of production.   [2]

(ii) Draw a diagram to illustrate the under-production resulting from an external benefit of
production and the corresponding deadweight welfare loss.   [3]

[Total 5]

10.3 A merit good:

A   is provided free of charge by the government.
B   provides benefits that are not fully appreciated by the prospective user.
C   has strong negative externalities.
D   cannot be supplied by the market.   [1½]

10.4 Explain why the following can be regarded as merit goods:

(i)   pensions

(ii) car insurance.

10.5 (a)   Assuming that training is paid for by the recipients of the training, explain why training
might be underprovided in a free market economy.

(b)   Explain and illustrate the effect of a subsidy equal to the marginal external benefit being
given to the training providers.   [8]

10.6 In the diagram below, S_1 is the supply curve for cigarettes before an indirect tax is imposed and
S_2 is the supply curve after the indirect tax has been imposed.
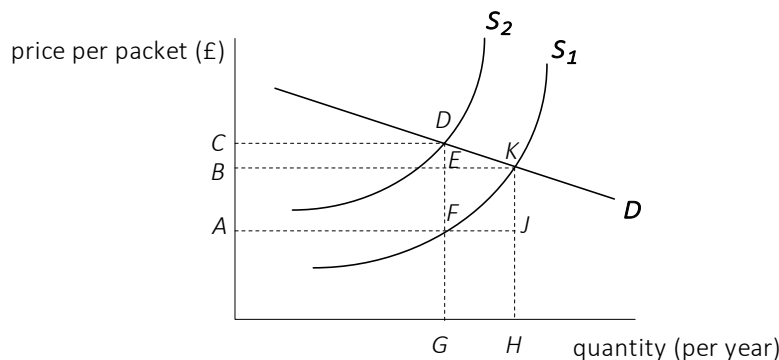
The annual revenue collected by the government in taxation is:

A   BCDK
B   ACDF
C   ABKJ
D   BCDE   [1½]

10.7 (i) Draw a diagram showing the demand D and supply S curves for a good. Show the

Exam style

equilibrium price by P_1 and the equilibrium level of sales by Q_1. [1]

(ii) On your diagram draw the line $S+T$ to show the new supply curve after an excise tax of T is imposed on the good. Denote the new equilibrium price and quantity by P_2 and Q_2. [2]

(iii) Show clearly on your diagram consumer and producer surplus before and after the tax, the government revenue and the excess burden (*ie* net welfare loss) from the tax. [3]

[Total 6]

10.8 Discuss the advantages and disadvantages of price ceilings and price floors.

Exam style

Your discussion should include examples. Illustrate your answer with the aid of appropriate diagrams. [10]

10.9 Explain how the following examples of collusion between firms are detrimental to consumers:

(i) horizontal price-fixing agreements

(ii) agreements to share out markets

(iii) agreements to limit production

(iv) bid rigging.

10.10 Which of the following is NOT a reason why market forces fail to generate sufficient research and development activity?

Exam style

A Some firms may try to copy the ideas of other firms.
B Firms will try to gain a competitive advantage over other firms in the market.
C Firms may duplicate other firms' research.
D The benefit to the firm of a particular piece of research is uncertain. [1½]

10.11 Which of the following would NOT be likely to increase the amount of research performed?

Exam style

A the introduction of a patent system
B increased funding to universities
C introduction of a tax on firms' research spending
D subsidies to firms conducting R&D [1½]

10.12 (i) Outline the reasons why the market may fail to provide an environment in which

Exam style

technological change can thrive. [3]

(ii) Outline how the government may intervene in the market to encourage firms to undertake research and development. [4]

[Total 7]

10.13 Suggest ways in which governments could regulate monopolies and oligopolies.

Module 10 Solutions

10.1 **(i)** *The Pareto optimum (or socially efficient) level of output*

The *Pareto optimum* (or socially efficient) output level is the level of output at which it is impossible to make anyone better off without making someone else worse off.   [1]

This occurs where marginal social benefit (MSB) is equal to marginal social cost (MSC).   [½]

The MSB is equal to the marginal private benefit plus the marginal external benefit.   [½]

The demand curve – which we assume shows consumers' valuation of each extra unit of output – shows the marginal private benefit of each extra unit consumed.   [½]

Assuming diminishing marginal utility, the demand curve slopes downwards.   [½]

So, assuming that the marginal external benefit is constant, the MSB curve slopes downwards.[½]

The MSC is equal to the marginal private cost plus the marginal external cost.   [½]

Assuming the marginal external cost is constant, the MSC curve is J-shaped.   [½]

As long as MSB exceeds MSC , social welfare can be increased by increasing output by an additional unit.   [½]

The Pareto optimum output level occurs where the rising MSC curve cuts the falling MSB curve.
[½]
[Maximum 4]

(ii) *Does the monopolist produce at the Pareto optimum level of output?*

Assuming there are no externalities, the Pareto optimal level of output is characterised by the condition that marginal private cost is equal to marginal private benefit (or price or average revenue).   [½]

Since, for a monopolist, $AR > MR$, the profit-maximising level of output for the monopolist (where $MC = MR$) occurs where $P > MC$ and therefore is less than the Pareto optimum.   [½]

However, the monopolist might produce at the socially optimal level of output if:

* it is required by government regulations to abandon profit maximisation and to produce at the level where price is equal to marginal cost   [½]

* it engages in first-degree price discrimination (where $P = MR$).   [½]
[Total 2]

10.2   *This question is based on Subject CT7, April 2011, Question 31.*

(i)   ***Definition and example of an external benefit of production***

An *external benefit of production* is a benefit from production experienced by people other than the producer directly involved in the transaction.   [1]

Possible examples of an external benefit of production include:

- forestry – planting new woodlands benefits the world through a reduction of CO_2 in the atmosphere

- R&D – if many firms have access to the research and development carried out by one firm, then they will be able to use such results to provide and develop better products

- training – existing employers will benefit from more efficient staff as a result of the training given by previous employers

- beekeeping – as a result of a beekeeper keeping bees, there will be an increased level of pollination of surrounding crops (and flowers)

- construction of an airport / train station / port – increased accessibility, which will benefit local businesses.   [1 for a valid example]

                                                                      [Total 2]

(ii)   ***Diagram to illustrate an external benefit of production***
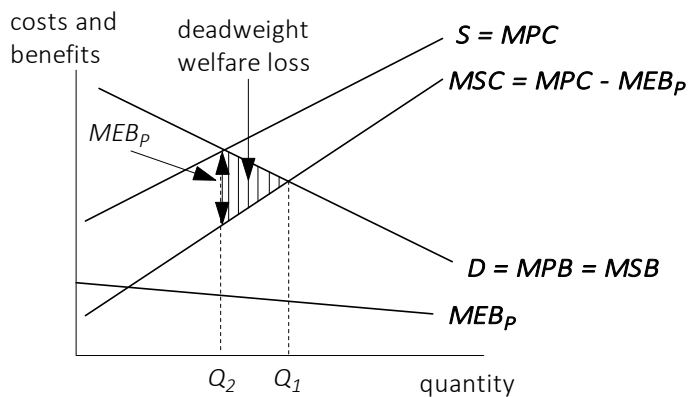
                                                                      [3 for diagram]

Note that the good is being under-produced in a free market by a quantity of $Q_1 - Q_2$.

10.3   Option B.

By definition, a merit good provides benefits that are not fully appreciated by the user (Option B). For example, not everyone appreciates their education at the time. It also has strong *positive* externalities, (ruling out Option C).

A merit good is a private good, *ie* it is rival and excludable. It therefore could be provided by the market, *eg* private schools (ruling out Option D) or by the government at a subsidised price (ruling out Option A).   [1½]

10.4   (i)   *Pensions*

Pensions satisfy the two main conditions of a merit good:

1.   their benefits are not fully appreciated by the user (because people often prefer to live for the present rather than save for the future)

2.   they confer external benefits (in that they prevent other people, *ie* future taxpayers, having to pay more tax to look after those who did not save for their pension during their working lives).

(ii)   *Car insurance*

Car insurance satisfies the two main conditions of a merit good:

1.   its benefits are not fully appreciated by the user (perhaps because people do not understand the risks or believe they will be safe)

2.   it confers external benefits (in that it offers protection for other people who might be injured and whose cars might be damaged by the insured driver).

10.5   (a)   *Why training is underprovided in a free market*

The perceived value of the benefits of training to the individual who receives and pays for the training is revealed in the demand curve. So, in the free market, Q_1 would be produced and consumed.
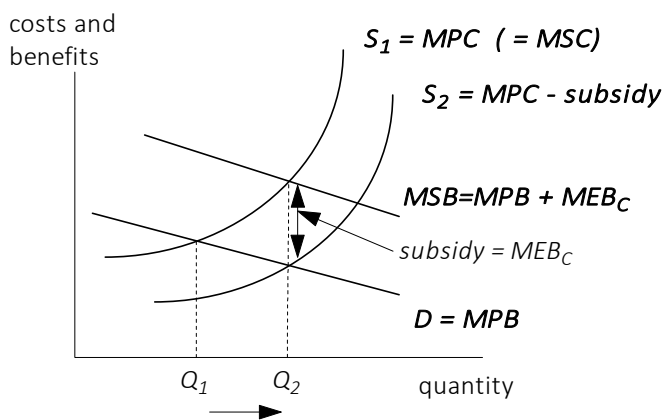
[1]

[2 for diagram]

However, this is less than the socially optimal output level of Q_2. Training confers external benefits, *eg* the skills passed on to other workers, and the benefits to present and future employers who profit from the workers' higher productivity. So $MSB > MPB$.   [1]

Also, training might be undervalued by the recipients and so the demand curve may be lower than it 'should' be.   [½]

This might be because individuals undervalue training is that the training as it incurs opportunity costs in the short run (including lost leisure time as time is devoted to study) but the benefits are only seen in the longer run.   [½]

At Q_1, $MSB > MSC$, so more training should be provided. The socially optimal output level is at Q_2 where $MSB = MSC$.   [1]

(b)   **Effect of a subsidy**

If a subsidy equal to the marginal external benefit at Q_2 is given to the producers, the producers' costs fall by the extent of the external benefit, …   [1]

… so that the profit-maximising position ($MPC = MPB$) becomes the socially optimal output level Q_2.   [1]

Alternatively, the subsidy could be given to the recipients of the training to shift their $D = MPB$ curve upwards, so it cuts the supply curve S_1 at Q_2.

[Total 8]

10.6   Option B. The imposition of an indirect tax raises firms' costs by the amount of that tax. Therefore the supply curve shifts vertically upwards by the amount of the tax. The vertical distance between the supply curves is DF. The equilibrium quantity sold after the imposition of the tax is G. Therefore, the tax revenue is $DF \times G = ACDF$.   [1½]

10.7   *This question is Subject CT7, September 2010, Question 32.*

(i), (ii), (iii)   **The diagram**

The following diagram illustrates all three parts of the question. *Note that the tax shifts the supply curve vertically upwards by the amount of the tax per unit.*

Prior to the introduction of the tax:

- the consumer surplus = $a + b + c + d$

- the producer surplus = $e + f + g + h$

After the imposition of the tax:

- the consumer surplus = a

- the producer surplus = h

- government revenue = $b + c + e + f$

- excess burden of tax = $d + g$
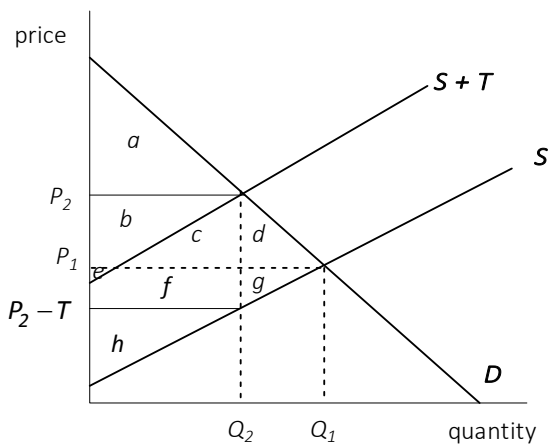
[6 for diagram]

10.8   A *price ceiling* operates when the government passes a law making it illegal to charge more than a certain amount for a good. A *price floor* exists when the government imposes a minimum price in a particular market.   [1]

When discussing the advantages and disadvantages of these policies, we assume that the price ceiling/floor is set below/above the free market equilibrium price so that it is 'binding'. Otherwise the free market equilibrium price and quantity are unaffected by the imposition of the price control.   [½]

Price ceilings

The following diagram shows the situation in which a price ceiling is set at a price level below the free market equilibrium price.
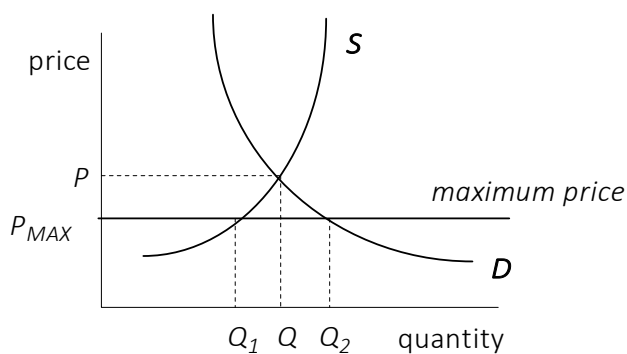
[1 for diagram]

With a price ceiling of P_{MAX}, suppliers will want to supply quantity Q_1, whereas consumers will demand quantity Q_2. The quantity traded will be Q_1. With this amount available, a shortage of $(Q_2 - Q_1)$ will develop.   [½]

The shortage will be greater, the greater the elasticities of demand and supply.   [½]

One *advantage* of this policy is that:

•   the lower price means that some people will be able to afford the good who could not do so under the free market equilibrium, (which is presumably the reason for the ceiling in the first place).   [½]

The *disadvantages* include the following:

•   The available supply needs to be rationed – rationing costs money and resources to operate.   [1]

•   Total consumption will be lower than under the free market equilibrium – with a consequent loss of utility to consumers.   [1]

•   Some suppliers may be tempted to offer goods for sale illegally at a price above the price ceiling, *ie* an illegal (shadow or underground) market may develop. This may encourage criminality. Additionally, there will be costs of enforcement involved in trying to prevent this activity.   [1]

Price floors

The diagram shows the situation in which a price floor is set at a price level above the free market equilibrium price.
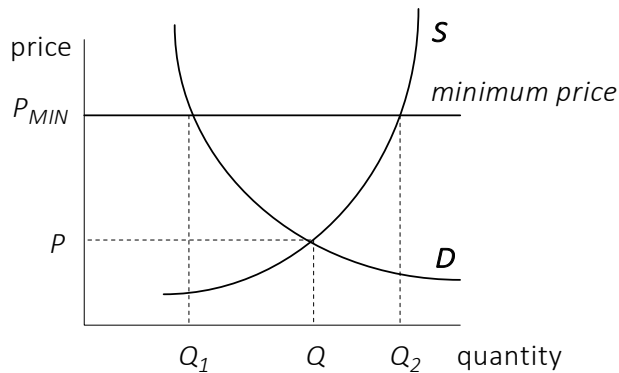
[1 for diagram]

With a price floor of P_{MIN}, suppliers want to supply quantity Q_2, but consumers will only demand quantity Q_1. So the quantity traded will be Q_1. With Q_2 available, there is a surplus of $(Q_2 - Q_1)$.

[½]

The surplus will be greater, the greater the elasticities of demand and supply.   [½]

If the government wants to maintain the price floor, it needs to be prepared to buy up the surplus supplies at the intervention price $P_{MIN.}$ [½]

One *advantage* of a price floor is that:

* the higher price provides a satisfactory reward and encourages greater supply. For example, a minimum wage is intended to raise wages at the bottom end of the labour market, so eliminating the so-called poverty trap and encouraging people on benefits back into work. In the case of agriculture, the intention is to provide farmers with a secure level of income regardless of fluctuations in the free market price of their produce, to encourage them to stay in farming.   [1]

The *disadvantages* include the following:

* The government has to buy up the surplus production. The surplus could be stored and released in times of shortage, but if the surplus continues, the government may have to destroy the surplus, or sell it on the world market (at a price which will be well below the minimum price it pays to producers). Such a policy can therefore prove very expensive to run.   [1]

* If the government does not buy up the extra supply, some suppliers may be tempted to break the minimum price rule and offer goods for sale at less than the official minimum, leading to a black market.   [½]

* Total consumption is again lower than under the free market equilibrium. Thus, the quantity traded is again sub-optimal, with a loss of utility compared with the free market equilibrium.   [1]

- In the case of a minimum wage enforced in the labour market, the labour surplus $Q_2 - Q_1$ represents unemployment.   [½]

- There may also be secondary effects elsewhere in the labour market, if the minimum wage affects the general level of wages throughout the labour market.   [½]

[Maximum 10]

10.9   (i)   ***Horizontal price-fixing agreements***

Consumers pay more for their goods because the colluding firms agree to set their prices at a level above the competitive price.

(ii)   ***Agreements to share out markets***

Each colluding firm is allocated a particular market (*eg* a geographical region) within which the other firms agree not to compete. Firms then use their market power in their allocated market to raise prices (or reduce quality).

(iii)   ***Agreements to limit production***

Reducing supply will drive up prices. Consumers will therefore pay more and consume less.

(iv)   ***Bid rigging***

The colluding firms all quote high prices for a contract (though one quotes slightly lower than the rest), which ensures that the contract goes to a firm with a bid above a fully competitive price and so consumers end up paying more.

10.10   Option B. One way to gain a competitive advantage is to exploit new ideas from a firm's research and development.   [1½]

10.11   Option C. A tax on research spending would increase the costs of research leading to less research being performed. Firms may instead increase their research if spending on R&D was eligible for tax relief or a subsidy.   [1½]

10.12   *This question is Subject CT7, April 2012, Question 33 (amended).*

(i)   ***Reasons why the market may fail to provide an environment in which technological change can thrive***

The market may fail to provide an environment in which technological change can thrive because of:

- *R&D free riders* – once research findings are made known, other firms will be able to benefit from the results without having contributed to the costs or taken any risk. These firms are known as *free riders*. As a result some firms will decide not to contribute to the R&D process, while the firms that do will not want to disseminate their results.   [1]

- *Monopolistic and oligopolistic structures* – competitive markets increase the need for firms to innovate to gain a market advantage. In contrast, monopolies and oligopolies have less pressure to innovate. (Conversely, the higher profits of monopolies may help fund R&D.)   [1]

- *Duplication* – several firms within an industry may be working independently on the same area of research. This duplication of effort is inefficient and results in less R&D in total. [1]

- *Risk and uncertainty* – there is a risk that a particular line of research will be unsuccessful. For this reason, firms tend to focus on the types of research that have the most certain market applications in the short term. However, this excludes more risky, but potentially more beneficial, long-term projects. Alternatively, they may choose not to undertake R&D at all.   [1]

[Maximum 3]

(ii)   ***How the government may intervene to encourage firms to undertake R&D***

The government may intervene in the market to encourage firms to undertake R&D using:

- *Patents* – temporary legal monopolies awarded to an inventor who registers an invention. The careful use of patents may help to achieve an optimum balance between encouraging individual firms to participate in R&D and a rapid diffusion of ideas. This is because the details of patents are published, but the patent holder is given legal protection in the use of the ideas within the patent for a period of time.   [1]

- *Public provision* – the government could perform its own R&D through research institutions it controls, or by funding universities. This approach is particularly appropriate when firms would not conduct this research themselves, several firms might duplicate the research and/or the research is of a long-term nature with no clear immediate application.   [1]

- *R&D subsidies* – as an alternative to performing its own research, the government could pay subsidies to firms conducting R&D. This would reduce a firm's disincentive to conduct R&D in the form of both cost and risk. A requirement of the subsidy may be that the firm must publicise its results and so aid the diffusion of ideas.   [1]

- *Co-operative R&D* – the government could encourage a number of firms to work together on a particular piece of R&D. This reduces the danger of duplication. Pooling of scarce resources may also allow the R&D team to reach a critical size required to make the project achievable, as well as spreading the risks involved.   [1]

- *Diffusion policies* – these are concerned with the provision of information on new technologies and/or the encouragement of the use of new technologies.   [1]

- *Other policies* – these are policies that are not directly concerned with R&D, but which may have an effect on the volume of R&D undertaken, for example education and training policies, competition policy, national defence policies and policies on standards and compatibility.   [1]

[Maximum 4]

10.13   Possible ways for governments to regulate monopolies and oligopolies (other possibilities exist):

- controlling the level of output (*eg* demanding that the socially optimal output level is produced)

- controlling prices (*eg* setting a maximum price such that the monopolist would then choose to produce the socially optimal level of output)

- breaking up monopolies (*eg* as the UK government did when privatising the electricity industry) or making monopolies illegal (as happens in the USA)

- preventing mergers that would lead to monopolies

- allowing monopolies, but taxing them heavily, and using the taxes to pay redistributive benefits

- nationalising the monopoly so that it can be run in the public interest.

11

The macroeconomic environment

Syllabus objectives

3.5   Discuss the macroeconomic environment of the business.

    1.   Describe the main macroeconomic variables that governments seek to control.

    9.   Discuss the determination of the price level in the economy by the interaction between aggregate supply and aggregate demand in a simple *AD-AS* model.

    11.   Explain what is meant by GDP and describe how it is measured.

    12.   Discuss the representation of the economy as a simple model of the circular flow of income.

Core Reading

Chapter 15 (Sections 1, 2, 4 and Appendix)   *Pages 444–457, 463–465, 485–489*

Chapter 20 (Section 1)   *Pages 623–626*

0   Introduction

Welcome to macroeconomics. Here is an overview of what we are going to cover in the rest of this course.

The main macroeconomic *objectives* that governments might typically pursue are:

* high and stable economic growth

* low unemployment

* low inflation

* the avoidance of balance of payments deficits and excessive exchange rate fluctuations

* a stable financial system and the avoidance of excessively financially distressed sectors of the economy, including government.

In order to achieve these objectives, governments use a variety of macroeconomic *policies*. The two main *branches* of macroeconomic policy are:

1.   demand-side policy – to influence aggregate demand in the economy

2.   supply-side policy – to increase aggregate supply directly, independently of aggregate demand.

The main *instruments* of government policy include:

* fiscal policy − the use of government spending and taxation

* monetary policy – the use of money supply and interest rates

* other policy instruments, *eg* exchange rate policy, competition policy, import controls.

In this module, we will introduce the main macroeconomic objectives, re-visit the circular flow model of the economy, which we met in Module 1, and examine how the level of national income (or output) is measured. Finally, we will introduce the *AD-AS* model of the economy, which is a useful model for exploring the effects of changes in variables on the price level and output, and for understanding the views of different schools of thought.

Most of this material is not new to Subject CB2 and was examined frequently in Subject CT7.

1 An overview of key macroeconomic issues

1.1 What's included in this section

- Major macroeconomic issues

- Government macroeconomic policy

1.2 Guidance

As a guide to the reading, the following might be of help:

- The text gives a good introduction to the major macroeconomic *objectives* but it doesn't say much about macroeconomic *policy*. This will be covered in depth later (beginning in the following module) but, for now, the introduction to this module gives a good overview of the macroeconomic picture.

- All of the *major* economic objectives will be discussed in great detail in Module 12 and in subsequent modules. However, the section on financial well-being, particularly the financial accounts, will not be covered again.

- The checklist below therefore focuses on financial well-being. Details on the other objectives will be covered in later checklists.

- The definition of net worth given in the third paragraph of page 451 is the correct definition; the definition given in the box on page 451 is incorrect in that it does not refer to liabilities. So, to be clear, *net worth* is the balance of a sector's or a country's stock of financial and non-financial assets *over its financial liabilities*.

1.3 Reading

Task	√*when completed*
Read Chapter 15, pages 445–451.	☐

1.4   Checklist

Task	√ *when completed*
Ensure that you can:	
• define the following key terms:	
– rate of economic growth	☐
– business cycle or trade cycle	☐
– number unemployed (economist's definition)	☐
– labour force	☐
– unemployment rate	☐
– rate of inflation	☐
– balance of payments account	☐
– exchange rate	☐
– financial instruments	☐
– financialisation	☐
– economic agents	☐
– balance sheet	☐
– asset	☐
– liability	☐
– net worth	☐
• describe why the financial system is important to economies	☐
• explain how financial well-being of the country can be analysed	☐
• state the five main macroeconomic objectives	☐
• give examples of macroeconomic policy instruments (see introduction to this module).	☐

1.5   Questions

Question

Classify the following:

(a)	competition policy
(b)	unemployment
(c)	fiscal policy
(d)	inflation
(e)	interest rates
(f)	exchange rate
(g)	balance of payments
(h)	financial system
(i)	money supply
(j)	economic growth
(k)	monetary policy
(l)	taxation
(m)	financial well-being
(n)	import controls
(o)	government spending
(p)	exchange rate controls

(i)	macroeconomic objectives
(ii)	macroeconomic instruments

Solution

<table>
<tr>
<td>
(i)   **macroeconomic objectives**

(b)   unemployment

(d)   inflation

(f)   exchange rate

(g)   balance of payments

(h)   financial system

(j)   economic growth

(m)   financial well-being
</td>
<td>
These are goals, *ie* low unemployment, low inflation, avoidance of balance of payments deficits and excessive exchange rate fluctuations, high and stable growth, a stable financial system and financial well-being.
</td>
</tr>
<tr>
<td>
(ii)   **macroeconomic instruments**

(a)   competition policy

(c)   fiscal policy

(e)   interest rates

(i)   money supply

(k)   monetary policy

(l)   taxation

(n)   import controls

(o)   government spending

(p)   exchange rate controls
</td>
<td>
These are ways of achieving the goals. For example, lower taxes might encourage consumer spending and decrease unemployment; exchange rate controls might be used to stabilise the exchange rate.
</td>
</tr>
</table>

Question

Which of these statements is FALSE?

A   The key accounts are compiled for the three main sectors of the economy (the household sector, the corporate sector and the government sector) and for the nation as a whole.

B   The three key accounts are: the income account, the capital account and the financial account.

C   The capital account records the stock of financial assets and liabilities.

D   Net worth is the market value of a sector's or a country's stock of financial and non-financial assets over its financial liabilities.

Solution

Option C. The *capital account* records the stock of non-financial (physical) wealth, such as property and machinery. The *financial account* records the stock of financial assets and liabilities in the balance sheet.

2   The circular flow of income

2.1   What's included in this section

- The difference between income and money

- The inner flow, withdrawals and injections

- The relationship between withdrawals and injections

- Equilibrium in the circular flow

2.2   Guidance

As a guide to the reading, the following might be of help:

- This is an important section. It contains some fundamental economic definitions and relationships.

- We first met the circular flow model in the introductory module, Module 1.

- The first part of this section introduces the circular flow model and also comments on the difference between income and money, terms that many students (incorrectly) use interchangeably.

- It is worth pointing out another confusion that sometimes arises. To an economist, *investment* is the purchase of equipment or materials that will add to the economy's stock of capital, *eg* tractors, computers, factories, stocks of raw materials. Such items are required only as a means of producing other products. In everyday life, people consider the purchase of shares or bonds to be an investment, but to an economist, this is a form of *saving*.

- Questions on the circular flow of income appeared regularly on Subject CT7 exam papers. In fact, the circular flow diagram can be used in examination questions even if the question does not ask for it specifically. This is because it helps us to understand 'what would happen if ……… ?'.

2.3   Reading

Task	*√when completed*
Read Chapter 15, pages 463–465.	☐

2.4 Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– withdrawals (*W*) or leakages	☐
– transfer payments	☐
– injections (*J*)	☐
• distinguish between money and income in terms of stock and flow concepts	☐
• draw and explain the circular flow diagram	☐
• explain why planned withdrawals need not equal planned injections	☐
• state the condition for an equilibrium level of national income	☐
• explain how equilibrium is restored if there is a change in withdrawals or injections.	☐

2.5 Questions

Question

Which of the following constitute investment in the economic sense?

(i)   the building of a new factory

(ii)   the building of a new school

(iii)   the purchase by Lidl of a supermarket previously owned by Morrisons

(iv)   the production of stocks which will be sold next year

(v)   depositing money in a bank account

(vi)   the purchase of shares from another investor

(vii)   the purchase of new shares issued by a company

Solution

(i)   Yes

(ii)   Yes

(iii)   No. A change in ownership of an existing capital good is *not* investment in the economic sense.

(iv)   Yes

(v)   No

(vi)   No

(vii)   No. Although the company may use the money raised to invest, the purchase of the shares is *not* investment in the economic sense.

Question

Using:

C = consumption

C_d = consumption on domestically produced goods

S = net savings

I = investment

T = net taxes

G = government spending on goods and services

M = imports

X = exports

define:

(i)   withdrawals (W)

(ii)   injections (J)

(iii)   aggregate demand (AD).

Solution

(i) $W = S + T + M$

(ii) $J = I + G + X$

(iii) $AD = C_d + J$

$= C_d + I + G + X$

$= C + I + G + X - M$

3   Measuring national income and output

3.1   What's included in this section

- The three ways of measuring GDP:
    - The product method
    - The income method
    - The expenditure method

- From GDP to national income

- Households' disposable income

- Interpreting national income data:
    - Taking account of inflation
    - Taking account of population: the use of per capital measures
    - Taking account of exchange rates: the use of PPP measures
    - Other problems when using GDP statistics as an indicator of standard of living

3.2   Guidance

As a guide to the reading, the following might be of help:

- There are two distinct stages involved in this section: firstly, learning the *techniques* of measuring the national income; and secondly, understanding the care that must be taken in *interpreting* the figures, especially when we want to make judgements about a country's standard of living over time, and even more so when we want to make international comparisons.

- You might therefore wish to tackle the material in the following order:
    - Read the introduction to the three ways of measuring GDP (page 452) and then turn to the Appendix (pages 485–489). This covers the *techniques* of measuring national income.
    - Read the remainder of Section 15.2 (pages 452-457). This covers the *interpretation* of the figures.

- The definition of Gross Value Added on page 486 is not quite correct. In the final sentence, the word 'include' should be deleted, so that it reads as follows: 'The figures exclude taxes on products (such as VAT) and subsidies on products.'

- Students sometimes confuse real and nominal variables, so it might be worth reading the box on page 453, which gives some examples. The numerical examples of converting nominal values to real values give *approximate* values for real variables (Subject CM1 gives an accurate formula).

- The material on interpreting national income data is new to CB2, though it was in the pre-2010 CT7 syllabus and therefore there are past exam questions to study.

3.3 Reading

Task	√when completed
Read Chapter 15, pages 452–457, 485–489.	☐

3.4 Checklist

Task	√when completed
Ensure that you can:	

- define the following key terms:
    - gross domestic product (GDP) ☐
    - gross value added (GVA) at basic prices ☐
    - stock (or inventory) appreciation ☐
    - GDP at market prices ☐
    - gross national income (GNY) ☐
    - depreciation ☐
    - net national income (NNY) ☐
    - households' disposable income ☐
    - nominal GDP ☐
    - real GDP ☐
    - purchasing power parity (PPP) exchange rate ☐
    - purchasing power standard (PPS) GDP ☐
    - social capital (OECD definition) ☐
- calculate GDP at market prices and basic prices by the:
    - product method ☐
    - income method ☐
    - expenditure method ☐
- calculate GNY and NNY at market prices and basic prices ☐
- calculate households' disposable income ☐
- describe the ways in which national income figures can be adjusted to take account of inflation, population and different currencies ☐
- discuss the problems involved in using real per capita PPS GDP as an indicator of the standard of living. ☐

3.5   Questions

Question

Why are transfer payments not counted when calculating GDP?

Solution

Transfer payments are payments transferred from one person or group to another, *eg* from taxpayers (via the government) to recipients of benefits, without any production taking place. They are not included in the calculation of GDP because we only include incomes that are earned from the *current year's production of goods and services*. If they were included in measures of national income, a country that increased taxes and transfer payments simultaneously to the same extent would appear to have increased its measured level of economic activity, yet it would not have increased the volume of goods and services being produced.

Question

You are given the following national accounting data for Country A:

	£ billions
Consumers' expenditure (excluding indirect taxes and subsidies)	80
Government expenditure on goods and services	50
Transfer payments	20
Investment expenditure	30
Import expenditure	40
Exports expenditure	25
Subsidies	15
Indirect taxes	20
Capital depreciation	5
Net income from abroad	20

(i)   Calculate the gross domestic product (GDP) at basic prices.

(ii)   Calculate the gross domestic product (GDP) at market prices.

(iii)   Calculate the gross national income (GNY) at market prices.

(iv)   Calculate the net national income (NNY) at market prices.

Solution

(i)   GDP at basic prices $= C + I + G + X - M$

$= 80 + 30 + 50 + 25 - 40 = £145bn$

(ii)   GDP at market prices   = GDP at basic prices + indirect taxes – subsidies

$= 145 + 20 - 15 = £150bn$

(iii)   GNY at market prices   = GDP at market prices + net income from abroad

$= 150 + 20 = £170bn$

(iv)   NNY at market prices   = GNY at market prices – depreciation

$= 170 - 5 = £165bn$

Question

If a country has negative net income from abroad then:

A   gross domestic product is greater than gross national income.

B   gross domestic product is less than gross national income.

C   gross domestic product is the same as gross national income.

D   we cannot say whether gross domestic product differs from gross national income from this information.

Solution

Option A. This is because, by definition, GNY = GDP + net income from abroad.

Question

Government statisticians in Country X are trying to estimate the changes in the country's standard of living over a 10-year period. The following table shows the available information:

	2008	*2018*
GDP (in $000 millions) at current prices	250	750
GDP deflator (1994 = 100)*	136	258
Population (in millions)	50	60

* The GDP deflator is the price index of all items that contribute to GDP.

(i)   Calculate the GDP for 2018 at 2008 prices, and hence the increase in real GDP.

(ii)   Calculate the growth in real GDP per head between 2008 and 2018.

Solution

(i)   ***GDP for 2018 at 2008 prices***

GDP for 2018 at 2008 prices = GDP at 2018 prices $\times \dfrac{\text{GDP deflator}_{2008}}{\text{GDP deflator}_{2018}} = 750 \times \dfrac{136}{258} = 395.349$

Therefore, the GDP for 2018 at 2008 prices is \$395,349 million.

Thus, the GDP in real terms has risen by 58.1%.

*Notice that GDP in **current prices** has increased from \$250,000 million to \$750,000 million − an increase of 200%.*

(ii)   ***Real GDP per head***

In 2008, GDP per head in 2008 prices $= \dfrac{250,000m}{50m} = \$5,000.$

In 2018, GDP per head in 2008 prices $= \dfrac{395,349m}{60m} = \$6,589.$

Therefore, real GDP per head has grown by 31.8% over the 10-year period.

Question

Describe seven factors that ought to be considered when using the real (PPS) GDP per capita figure as an indicator of a country's standard of living.

Solution

- *Non-marketed goods and services* (*eg* do-it-yourself decorating, childcare) do not enter into the GDP calculations, so if there is an increase in the employment of specialists, such as decorators and nursery nurses, the rise in GDP will overstate the increase in output.

- *Unreported market transactions* (*ie* the 'underground' economy) might cause GDP to underestimate the standard of living, *eg* illegal activities, such as a trade in drugs, and work that is unreported in order to avoid paying tax or to avoid losing benefits.

- The *proportion of the growth of GDP that is made up of consumption* is important because this reflects the extent to which growth is improving current living standards. If the increase in GDP arises from an increase in investment or exports, this will not benefit current consumers (though investment will improve *future* living standards).

- Any *change in the work/leisure relationship* needs to be considered. For example, an increase in GDP achieved as a result of a longer working week (or life) might not be viewed as an improvement in living standards.

- An increase in *negative externalities* (*eg* pollution, congestion, depletion of natural resources, stress, crime) sometimes accompanies an increase in GDP. In this case, an increase in GDP would overestimate the increase in the standard of living.

- Paradoxically, the output from *industries set up to combat some of these negative externalities*, (*eg* environmental services, health services, security services) contribute to an *increase* in GDP.

- The *distribution of income* should be considered, since an increase in GDP might not have been very widely dispersed.

4   The *AD-AS* model

4.1   What's included in this section

- The aggregate demand (*AD*) curve

- The aggregate supply (*AS*) curve

- Equilibrium

4.2   Guidance

As a guide to the reading, the following might be of help:

- This is a short section and should be relatively easy to follow because many of the ideas introduced in a macroeconomic context should already be familiar in a microeconomic context.

- It is important to remember and understand:
  - the reasons for the downward-sloping *AD* curve and the upward-sloping *AS* curve
  - the causes of shifts in the *AD* curve and the *AS* curve.

- On page 624, under the subheading 'shifts in the aggregate demand curve', there is a slight mistake in the first sentence. The 'inwards' and 'outwards' should be swapped, so that the relevant section reads, ' … shift outwards (to the right) or inwards (to the left) …'.

- In this module, we use the most widely accepted view of the short-run aggregate supply curve. However, we will return to the topic later as the shapes of both the short-run and the long-run supply curve are strongly debated by economists.

4.3   Reading

Task	√*when completed*
Read Chapter 20, pages 623–626.	☐

4.4 Checklist

Task	√ *when completed*
Ensure that you can:	
• define the following key terms:	
– GDP deflator	☐
– international substitution effect	☐
– inter-temporal substitution effect	☐
– real balance effect	☐
• explain the shapes of the *AD* and (short-run) *AS* curves	☐
• use the *AD-AS* diagram to:	
– show the equilibrium price level and the equilibrium level of real national income	☐
– analyse the effect of a change in *AD* or *AS* on the equilibrium position.	☐

4.5 Questions

Question

Which of the following will result in a decrease in aggregate demand, other things being equal?

A   a rise in imports

B   a fall in savings

C   a fall in interest rates

D   a fall in economic and business uncertainty

Solution

Option A. Aggregate demand will decrease if any of its components (C, I, G or $(X - M)$) decrease. A rise in imports will reduce net exports and so reduce aggregate demand. All of the other options cause an *increase* in aggregate demand: a fall in savings will typically lead to a rise in consumption; a fall in interest rates will make saving unattractive and borrowing (for consumption and investment) more attractive; and a fall in economic and business uncertainty will tend to increase consumption and investment.

Question

In the short run, a decrease in exports is likely to lead to:

A   a decrease in the price level and an increase in output.
B   an increase in the price level and an increase in output.
C   a decrease in the price level and a decrease in output.
D   an increase in the price level and a decrease in output.

Solution

Option C. A decrease in exports will decrease aggregate demand and cause the *AD* curve to shift to the left. In the short run, this will cause a fall in the price level and a fall in output, as can be seen in the following diagram.
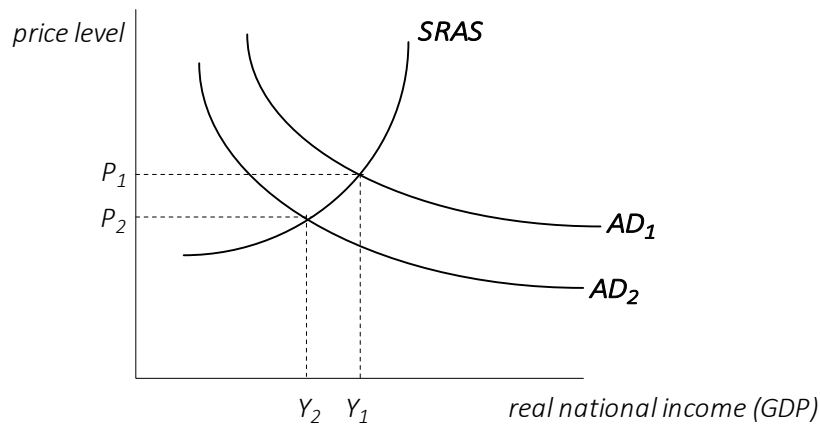
Question

Which of the following is a possible explanation for an increase in the average price level and a decrease in real national income?

A   an increase in short-run aggregate supply
B   a decrease in short-run aggregate supply
C   an increase in aggregate demand
D   a decrease in aggregate demand

Solution

Option B. We have been asked for a possible explanation for an increase in the average price level and a decrease in real national income. We can see from the diagram that this will happen if the *SRAS* curve shifts to the left, *ie* if there is a decrease in short-run aggregate supply.
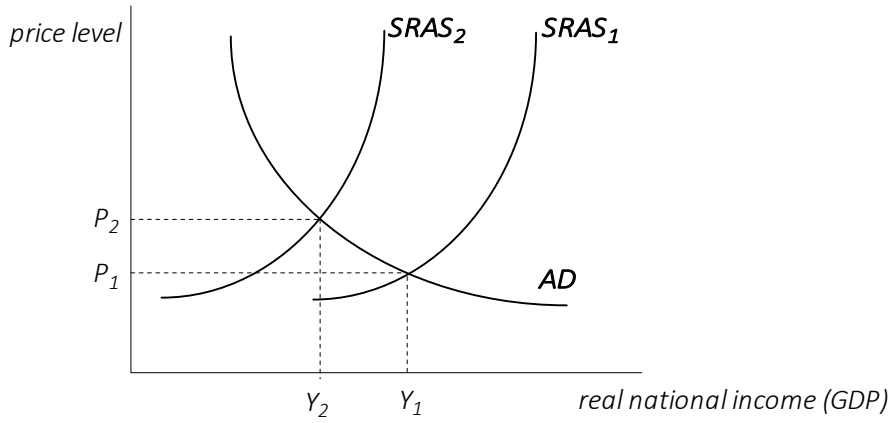
Module 11 Practice Questions

11.1   Describe the accounts that may be used to help assess the financial well-being of individuals, businesses, governments and the nation as a whole.   [5]

Exam style

11.2   In the circular flow of income model of an economy, which of the following are injections?

Exam style

A   investment, government spending and imports

B   investment, government spending and exports

C   savings, taxes and imports

D   investment, consumer spending and exports   [1½]

11.3   To obtain a measure of gross domestic product at market prices from gross value added at basic prices, it is necessary to:

Exam style

A   deduct any transfer payments made by the government to households.

B   add any indirect taxes and deduct subsidies on products.

C   deduct any indirect taxes and add subsidies on products.

D   add net income from abroad.   [1½]

11.4   The following table contains output and expenditure data for an economy:

Exam style

	£ billions
Consumption (at market prices)	300
Investment (at market prices)	90
Government spending (at market prices)	100
Net exports (at market prices)	−10
Net income from abroad	15
Indirect taxes	60

Gross Domestic Product at basic prices and Gross National Income at market prices are respectively:

A   420, 495

B   480, 435

C   420, 435

D   480, 495   [1½]

11.5 The following information is extracted from a country's National Statistical Bureau:

	€ billions
Wages and salaries	350
Mixed incomes	38
Net income from abroad	15
Gross profit/rent and interest of firms, government and other institutions	150
Taxes on products	71
Subsidies on products	3
Depreciation	65

   (i)   Calculate the Gross Domestic Product at market prices.   [1]

   (ii)   Calculate Gross National Income at market prices.   [1]

   (iii)   Calculate the Net National Income at market prices.   [1]

                                               [Total 3]

11.6 Assume that the total output of goods and services is held constant and the price level increases. Which of the following observations concerning Gross Domestic Product (GDP) is TRUE?

   A   Nominal GDP rises and real GDP falls.
   B   Nominal GDP falls and real GDP rises.
   C   Nominal GDP rises and real GDP stays the same.
   D   Nominal GDP stays the same and real GDP rises.   [1½]

11.7 In 2000, the nominal Gross Domestic Product (GDP) per capita is £20,000 and the price index is 100. In 2007, the nominal GDP per capita is £30,000 and the price index is 120. Real GDP per capita for 2007 at 2000 prices is:

   A   £24,000.
   B   £25,000.
   C   £36,000.
   D   none of the above.   [1½]

11.8 Which of the following could explain why a country's aggregate demand curve might shift inwards to the left?

   A   a decrease in interest rates
   B   a rise in exchange rates
   C   a rise in government expenditure
   D   an increase in business confidence   [1½]

11.9   (i)   Draw and appropriately label an aggregate demand – aggregate supply diagram.   [2]

Exam style   (ii)   (a)   Show the impact of a positive supply shock on the market.

              (b)   Explain your diagram.   [2]

[Total 4]

The solutions start on the next page so that you can
separate the questions and solutions.

ABC   **Module 11 Solutions**

11.1   The *income account* records the various flows of income alongside the amounts either spent or saved.   [½]

For example, most households would record wages as income and rent as expenditure.   [½]

The *financial account* comprises:

- the *balance sheet*, which gives a complete record of the stocks of financial assets (*eg* bank deposits, bonds and shares) and financial liabilities (*eg* mortgages, business loans)   [1]

- a record of financial flows, comprising new saving, borrowing and repayments.   [½]

The *capital account* records:

- the stock of non-financial wealth, which includes physical assets, such as property and machinery   [1]

- the capital flows, which occur when acquiring or disposing of physical assets.   [½]

The balance of a sector's or a country's financial and non-financial assets over its financial liabilities is known as its *net worth*.   [½]

The *national balance sheet* is a measure of the wealth of a country. It can be presented so as to show the net worth of each sector and/or the composition of wealth.   [1]

[Maximum 5]

11.2   Option B. This can be seen in the circular flow diagram. Option C lists the three withdrawals. Consumption is not an *injection* of spending into the circular flow; instead it is part of the circular flow.   [1½]

11.3   *This question is Subject CT7, September 2008, Question 17*.

Option B. The market prices of some products, *eg* petrol, exceed the basic cost of production because indirect taxes (*ie* taxes on products) are added. Likewise, the market prices of other products, *eg* some bus services, are lower than the basic cost of production because subsidies are given by the government. So to get from basic prices to market prices, we must add on indirect taxes and deduct subsidies.   [1½]

11.4   *This question is Subject 107, April 2002, Question 16*.

Option A.

Gross Domestic Product at basic prices is the value of domestically-produced output at the cost of production. Since all expenditure is given at market prices, indirect taxes must be deducted to arrive at basic prices.

$$\text{GDP at basic prices} = C + I + G + (X - M) - \text{indirect taxes}$$

$$= 300 + 90 + 100 - 10 - 60$$

$$= 420$$

Gross National Product at market prices is the value of output produced by the nation's resources wherever located, valued at market prices. This is found as follows:

GNP at market prices $= C + I + G + (X - M) +$ net income from abroad

$$= 300 + 90 + 100 - 10 + 15$$

$$= 495 \hspace{6cm} [1½]$$

11.5 *This question is Subject CT7, April 2010, Question 33*.

(i)   ***GDP at market prices***

GDP at basic prices is:

= wages and salaries + mixed incomes + gross profit, rent and interest

$= 350 + 38 + 150 = 538$

GDP at market prices is:

= GDP at basic prices + taxes on products − subsidies on products

$= 538 + 71 - 3 = 606$

Therefore, GDP at market prices is €606 billion. $\hspace{4cm}$ [1]

(ii)   ***GNY at market prices***

GNY at market prices is:

= GDP at market prices + net income from abroad

$= 606 + 15 = 621$

Therefore, GNY at market prices is €621 billion. $\hspace{4cm}$ [1]

(iii)   ***NNY at market prices***

NNY at market prices is:

= GNY at market prices − depreciation

$= 621 - 65 = 556$

Therefore, NNY at market prices is €556 billion. $\hspace{4cm}$ [1]

11.6 *This question is Subject 107, September 2002, Question 19*.

Option C. Nominal GDP is the total value of output at current prices. Real GDP is the total value of output at constant prices, *ie* removing the effect of inflation between the years being considered. If output is constant, then real GDP will be constant. If prices have risen, then nominal GDP will have risen. $\hspace{2cm}$ [1½]

11.7   *This question is Subject CT7, September2008, Question 18*.

Option B. The average level of prices across the whole economy increased by 20% between 2000 and 2007. So, to compare the 2007 GDP figure *in real terms* with that in 2000, we need to deflate the 2007 figure accordingly. Thus, the GDP per capita in 2007 in terms of 2000 prices is given by:

$$£30,000 \times \frac{100}{120} = £25,000$$ [1½]

11.8   *This question is Subject CT7, April 2011, Question 17*.

Option B. The *AD* curve will shift inwards to the left if any of its components (C, I, G or $(X - M)$) decrease. A rise in exchange rates will make exports less competitive and imports relatively cheap. Therefore there is likely to be a decrease in demand for exports and an increase in demand for imports.

The other options are all likely to *increase AD*: a decrease in interest rates will *increase* consumption and investment as saving is less attractive and borrowing (and hence spending) is more attractive; a rise in government expenditure will lead to a direct *increase* in *AD*; and an increase in business confidence is likely to *increase* the level of investment.   [1½]

11.9   *This question is Subject CT7, April 2008, Question 35*.

(i)   ***AD-AS diagram***
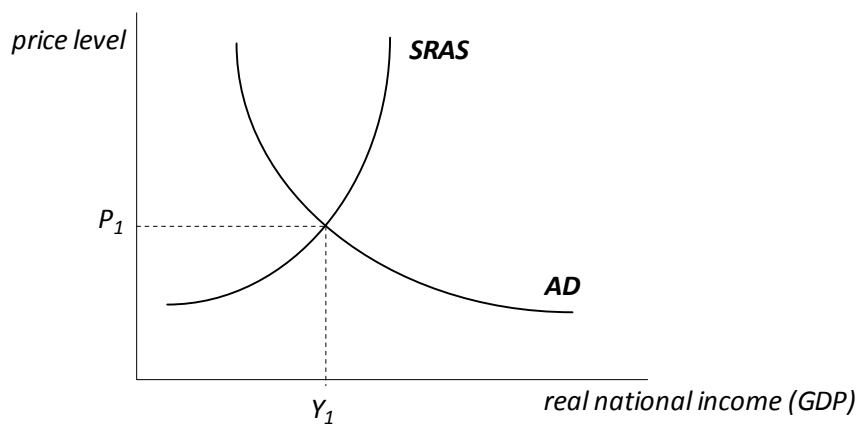
                                                                                                [2]

(ii)   *Effect of a positive supply-side shock*
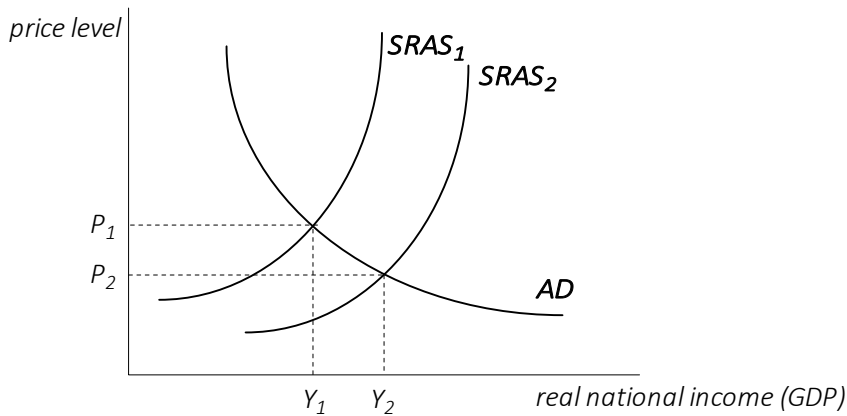
We start from an equilibrium position at (P_1 , Y_1). A positive supply shock, *eg* the immigration of labour, will increase the supply of labour and reduce costs, so the *SRAS* curve will shift to the right. As the price level decreases, aggregate demand extends, *ie* there will be a movement along the *AD* curve from left to right. The new equilibrium position is at (P_2 , Y_2), *ie* the price level is lower and real national income is higher than before the shock.   [2]

12

Macroeconomic objectives

Syllabus objectives

3.5   Discuss the macroeconomic environment of the business.

   4.   Contrast actual and potential growth.

   5.   Describe the factors that determine economic growth and explain the reasons for differences in different nations' growth rates.

   6.   Discuss the relationship between economic growth and environmental sustainability.

   7.   Describe why economies experience periods of boom followed by periods of recession and explain factors which influence the length and magnitude of the phases of a business cycle.

   8.   Describe the causes and costs of unemployment and how unemployment relates to the level of business activity.

   10.   Describe the causes and costs of inflation and how inflation relates to the level of business activity.

3.9   Discuss what determines the level of business activity and how it affects unemployment and inflation.

   4.   Describe the relationship between unemployment and inflation and whether the relationship is stable.

Core Reading

0   Introduction

This module discusses three key macroeconomic variables:

1.   economic growth

2.   unemployment

3.   inflation.

Section 1 focuses on economic growth and the business cycle, in particular how growth varies throughout the business cycle. The important issue of long-term economic growth is also briefly considered.

Section 2 considers the topic of unemployment and the labour market, including the different causes of unemployment.

Finally, Section 3 examines the important issue of inflation, in particular the different causes and costs of inflation. This section also starts to examine the relationship between inflation and unemployment by considering the Phillips curve.

Much of the material in this module appeared in the Subject CT7 course and was examined regularly.

1 The business cycle

1.1 What's included in this section

- The distinction between actual and potential growth

- The hypothetical business cycle

- The business cycle in practice

- An international business cycle

- Aggregate demand and the business cycle

- Aggregate supply and the business cycle

1.2 Guidance

Bear in mind that governments face two main policy issues regarding economic growth:

1.   in the *short run* – how to influence the level of actual growth so that actual output is as close as possible to potential output (the sustainable level of output that could be produced by the economy)

2.   in the *long run* – how to encourage growth in potential output. This is important and is covered only briefly in the reading for Subject CB2; in the subsection entitled 'Factors affecting potential output and potential growth' and in the box 'Threshold Concept 14'.

Box 15.3 gives some useful information on output gaps – the difference between actual output and potential output. It considers the theory of output gaps and how to measure them.

Note that the *international business cycle* has arisen through *globalisation*, which is discussed in Module 13 and, in particular, the increased interdependency of economies and financial systems, which is discussed in Module 22.

1.3 Reading

Task	√*when completed*
Read Chapter 15, pages 457–462.	☐

1.4   Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– actual growth	☐
– potential growth	☐
– potential output	☐
– output gap	☐
– aggregate demand	☐
– aggregate supply	☐
• distinguish between:	
– actual, potential and full-capacity output	☐
– actual and potential economic growth	☐
• describe the likely impact on spare capacity, unemployment and the output gap of the actual growth rate being different from the potential growth rate	☐
• describe the factors that contribute to growth in potential output	☐
• describe the influences on actual economic growth in the short run and the long run	☐
• describe, with the aid of a diagram, the phases of the business cycle	☐
• describe two ways in which business cycles may be irregular	☐
• explain why business cycles may have both national and global components	☐
• outline the components of aggregate demand (AD) and the relationship between AD and the business cycle	☐
• describe three ways of measuring the output gap	☐
• discuss the influences of the following on the business cycle: consumer spending, investment, the financial sector, aggregate supply.	☐

1.5   Questions

Question

Outline, with the aid of a diagram, the four stages of the business cycle.

Solution

The business cycle can be illustrated as follows:
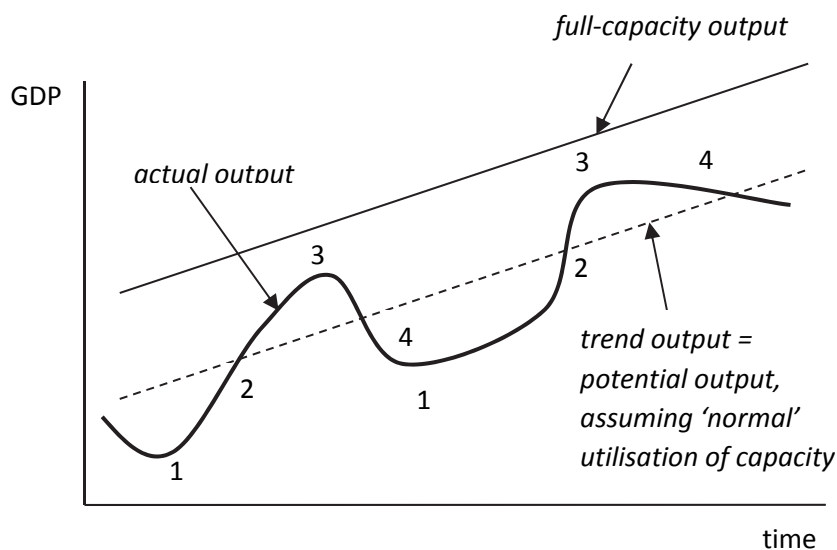
where:

1.   is the *upturn*

2.   is the *expansion*

3.   is the *peaking out*

4.   is the *slowdown, recession* or *slump*.

Before the *upturn*, actual output is well below potential output.

During the *upturn*, the economy starts to recover and output grows.

During the *expansion*, output grows rapidly. Output moves toward (and eventually, possibly exceeds) potential output.

During the *peaking out* stage, growth slows and may stop.

If output begins to fall then growth will become negative. The economy will be in *recession*.
Actual output will move towards, and eventually probably fall below potential output.

Question

Distinguish between actual output and potential output.

Solution

Actual output is the value of output produced in reality.

Potential output is the sustainable level of output that could be produced in the economy, *ie* one that involves a 'normal' level of capacity utilisation and does not result in rising inflation.

The difference between actual output and potential output is known as the output gap.

Question

State the main determinants of growth in potential output.

Solution

Changes in the *quantity* of resources:

- capital

- labour

- natural resources (land and raw materials).

Changes in the *productivity* of resources. Improvements in productivity depend on:

- technological progress

- labour skills and knowledge which are, in turn, dependent on education and training

- improvements in efficiency.

2   Unemployment and the labour market

2.1   What's included in this section

- Claimant unemployment and standardised unemployment

- The composition of unemployment

- The duration of unemployment

- Causes of unemployment

- Modelling the labour market

2.2   Guidance

Box 15.4 provides an important discussion about the costs of unemployment, both to the unemployed individual and the wider environment (friends, family, the economy and society in general).

Figure 15.10 is a useful illustration of the pool of unemployment. It might be worth looking at this before starting to read this section to make it clear how individuals become (and subsequently cease being) unemployed.

2.3   Reading

Task	√when completed
Read *Chapter 15*, pages 466–472.	☐
Read *Chapter 20*, pages 634–637 (introduction and subsection on modelling the labour market).	☐

2.4   Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– claimant unemployment	☐
– standardised unemployment rate	☐
– real-wage unemployment	☐
– demand-deficient or cyclical (or Keynesian) unemployment	☐
– frictional (search) unemployment	☐
– structural unemployment	☐
– technological unemployment	☐
– regional unemployment	☐
– seasonal unemployment	☐
– aggregate demand for labour curve	☐
– aggregate supply of labour curve	☐
– disequilibrium unemployment	☐
– equilibrium ('natural') unemployment	☐
• describe the two official measures of unemployment and the differences between them	☐
• explain the reasons why unemployment rates vary between countries and between different groups within countries	☐
• explain the costs of unemployment to the individual, their family and friends, and the economy	☐
• explain why the costs of unemployment may be offset by some benefits of unemployment	☐
• describe the three factors that affect the average duration of unemployment	☐
• outline who makes up the inflows to and outflows from the pool of unemployment	☐
• calculate the average duration of unemployment using figures for the stock of unemployment and outflow from unemployment	☐
• discuss the main causes of unemployment	☐
• calculate a real wage rate using figures for the nominal wage rate and a price index.	☐

Task	√ *when completed*
Continued	
Ensure that you can:	
• outline potential remedies for frictional (search) unemployment	☐
• outline the causes of structural unemployment	☐
• describe the three factors that determine the level of structural unemployment	☐
• state the two main approaches to reducing structural unemployment	☐
• explain the shapes of the aggregate supply of and demand for labour curves	☐
• draw a diagram showing: – the aggregate supply of and demand for labour curves – the equilibrium wage rate and level of employment – the curve of the total number in the labour force – equilibrium and disequilibrium unemployment	☐
• state the two conditions that must hold for disequilibrium unemployment to occur	☐
• describe the types of disequilibrium unemployment	☐
• describe the types of equilibrium unemployment	☐
• outline the factors that affect the 'wage offer' (W_o) and 'wage acceptability' (W_a) curves	☐
• draw a diagram to illustrate demand-deficient unemployment	☐
• draw a diagram to show how wage offers and wage expectations for an unemployed individual will vary with the length of time unemployed.	☐

2.5   Questions

Question

Consider the following diagram of the labour market:
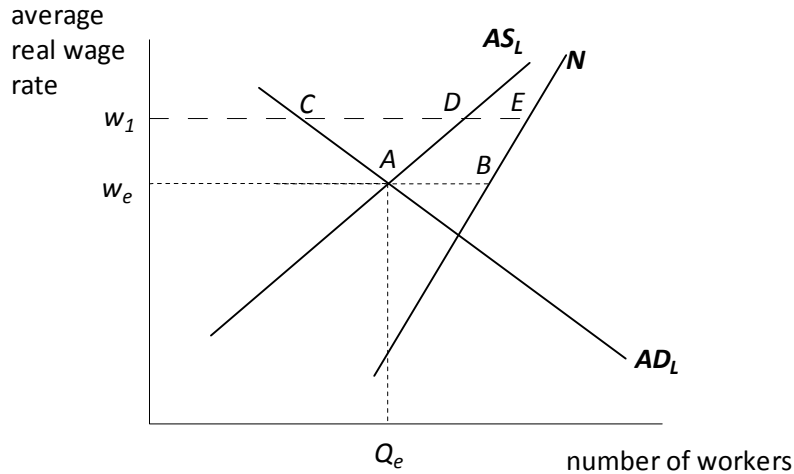
(i)   Why does the AS_L curve converge with the N curve at higher real wage rates?

(ii)   For a given wage rate, what does the rectangle formed by the origin, Q_e, A and w_e represent?

(iii)   Describe what is represented by the horizontal distances:

   (a)   CD

   (b)   CE

   (c)   AB

Solution

(i)   ***The slope of the AS_L***

The difference between the curves is the excess of those looking for work over those actually willing and able to take a job. The opportunity cost of being unemployed is the difference between the wage rate and the level of state unemployment benefits. At higher wage rates the opportunity cost increases, and so the two schedules converge.

(ii)   ***The area of the rectangle***

At a given wage rate, the demand for labour can be found. Thus, the area of the rectangle described represents the total wage bill in real terms (average real wage rate × number of workers) to firms, or equivalently, the total incomes from labour, when the labour market is in equilibrium.

(iii)   *Distances on the diagram*

(a)   CD is the difference between the number of jobs available and the number of people willing and able to take a job, at the given real wage rate (w_1). It thus represents the level of *disequilibrium* unemployment, given the wage rate.

(b)   CE is *total* unemployment at the given real wage rate (w_1).

(c)   Point A is the equilibrium point. The number of people willing to take jobs is equal to the demand for labour. Thus, AB is the level of equilibrium (or natural) unemployment at the equilibrium real wage rate (w_e).

Question

The standardised unemployment rate:

A   is generally higher than claimant rate.
B   is generally lower than claimant rate.
C   is generally equal to claimant rate.
D   measures only those in receipt of unemployment benefits.

Solution

Option A. The standardised rate is generally higher, since it includes people who are seeking work but are not eligible for unemployment benefit. The claimant rate is a measure of those in receipt of unemployment benefits.

Question

Define the following types of unemployment:

(i)   structural unemployment

(ii)   demand-deficient unemployment

(iii)   real-wage unemployment

(iv)   frictional unemployment.

Solution

(i)   *Structural unemployment*

Equilibrium unemployment that arises from changes in the pattern of demand or supply in the economy. People made redundant in one part of the economy cannot immediately take up jobs in other parts (even though there are vacancies).

(ii)   *Demand-deficient unemployment*

Disequilibrium unemployment caused by a fall in aggregate demand with no corresponding fall in the real wage rate.

(iii)   *Real-wage unemployment*

Disequilibrium unemployment caused by wages being driven above the market-clearing level.

(iv)   *Frictional unemployment*

Equilibrium unemployment that occurs as a result of imperfect information in the labour market. It often takes time for workers to find jobs (even though there are vacancies) and in the meantime they are unemployed.

3   Inflation and the *AD-AS* model

3.1   What's included in this section

- Different inflation rate measures

- Causes of inflation

- Demand-pull inflation

- Cost-push inflation

3.2   Guidance

Box 15.5 discusses the costs of inflation, in both the cases where it is *anticipated* and when it is *unanticipated*.

Box 15.6 introduces the Phillips curve, which illustrates the relationship between inflation and unemployment. In this section, we focus on the key features of the (original) Phillips curve, however, the Phillips curve will be revisited in more detail in Module 17.

3.3   Reading

Task	*√when completed*
Read Chapter 15, pages 472–478.	☐
Read Chapter 20, pages 626–630.	☐

3.4   Checklist

Task	*√when completed*
Ensure that you can:	
• define the following key terms:	
– GDP deflator	☐
– demand-pull inflation	☐
– cost-push inflation	☐
– menu costs of inflation	☐
– Phillips curve	☐
– money illusion	☐
• state the differences between the consumer prices index (CPI) and the retail prices index (RPI)	☐
• calculate an annual rate of inflation using price index values.	☐

Task	√*when completed*
Continued	
Ensure that you can:	
• explain the key features of demand-pull and cost-push inflation	☐
• distinguish between demand / supply shocks and persistent changes in demand / supply	☐
• discuss the costs of inflation	☐
• give examples of how demand-pull and cost-push inflation may interact	☐
• outline the impact of expectations on inflation	☐
• explain the key features and implications of the original Phillips curve	☐
• use the *AD-AS* model to illustrate demand-pull and cost-push inflation including subsequent effects (where both AD and AS curves shift).	☐

3.5 Questions

Question

Which of the following could be a potential source of demand-pull inflation?

A   an increase in income and corporation tax rates
B   an increase in imported commodity prices, independent of aggregate demand
C   an increase in imports
D   an increase in consumer expenditure

Solution

Option D. Demand-pull inflation occurs when there is a persistent increase in the level of aggregate demand. Options A and C would lead to a *decrease* in aggregate demand. Option B would lead to cost-push inflation.

Question

The (original) Phillips curve shows:

A   a positive relationship between inflation and unemployment.
B   the influence of supply-side policies on the level of inflation and unemployment.
C   the influence of monetary policy on the level of inflation and unemployment.
D   an inverse relationship between inflation and unemployment.

Solution

Option D. The (original) Phillips curve shows a trade-off between higher inflation and lower unemployment.

Module 12 Practice Questions

12.1 Outline why, when considering economic growth, it is important for a government to consider both aggregate demand and supply-side policies. [2]

Exam style

12.2 Describe what affects the gap between potential output and:

Exam style
- full-capacity output
- trend output. [4]

12.3 Which of the following would be LEAST likely to increase the rate of economic growth?

Exam style
A   an increase in the availability of land
B   an increase in marginal rates of taxes
C   an increase in the provision of nursery education
D   an increase in investment [1½]

12.4 Explain the differences between the claimant unemployment rate and the standardised unemployment rate. [3]

Exam style

12.5 Outline the costs of unemployment. [5]

Exam style

12.6 Some people leave their job voluntarily, becoming unemployed whilst they search for another. Outline the benefit of such actions for the individuals and the wider economy. [3]

Exam style

12.7 A rise in unemployment caused by a fall in the demand for the products of some industries (even though there is a rise in demand for the products of other industries) is known as:

Exam style

A   frictional unemployment.
B   structural unemployment.
C   technological unemployment.
D   demand-deficient unemployment. [1½]

12.8 One way of reducing the equilibrium (or natural) rate of unemployment would be:

Exam style

A   to increase income taxes.
B   to increase information on job availability.
C   to reduce government expenditure.
D   to increase interest rates. [1½]

12.9   (i)   Draw a diagram to illustrate the labour market. Label the aggregate demand for labour

Exam style   curve AD_L, the labour force curve as N and the aggregate supply of labour curve AS_L. [1]

        (ii)   Mark on your diagram a point A where the labour market is in equilibrium. Label the
               equilibrium wage rate w_1 and the equilibrium level of employment Q_1.   [1]

        (iii) Mark on your diagram the distance that represents the equilibrium (or natural) level of
               unemployment and label it *EQ*.   [1]
                                                                                          [Total 3]

12.10   Which one of the following is NOT a cause of cost-push inflation?

Exam style
        A   an increase in the price of raw materials
        B   an increase in wages above increases in labour productivity
        C   an increase in profit margins applied by firms
        D   an increase in consumer spending   [1½]

12.11   Use the *AD-AS* model to illustrate and explain the difference between demand-pull and cost-push
        inflation. Your answer does not need to cover scenarios in which both the aggregate demand and
Exam style   aggregate supply curves shift.   [6]

Module 12 Solutions

12.1   Changes in aggregate demand have a substantial impact on economic growth in the short
        term.   [½]

        So, manipulation of aggregate demand can enable a government to influence short-term
        economic growth …   [½]

        … which should help to reduce the occurrence and severity of issues such as unemployment and
        excessive inflation.   [½]

        However, long-term economic growth is dependent on increases in the quantity and/or
        productivity of factors of production.   [½]

        Supply-side policies aim to increase directly the quantity and/or productivity of these factors of
        production and so are important in enabling long-term economic growth.   [½]
                                                                                          [Maximum 2]

12.2   *Potential output vs full-capacity output*

        The gap is determined by the extent of the *spare capacity* in the economy.   [½]

        Potential output is the sustainable level of output that could be produced if the economy is
        working at 'normal' utilisation of capacity*, ie* with a certain 'normal' amount of spare
        capacity …   [½]

        … whereas *full-capacity output* is the absolute maximum that could be produced.   [½]

        If spare capacity stays constant over time, then the gap between potential output and full-
        capacity output will remain unchanged and the slopes of the potential output line and the full-
        capacity output line will be the same.   [½]

        However, if the 'normal' amount of spare capacity increases over time, *ie* the 'normal' utilisation
        of capacity decreases, then the gap between potential output and full-capacity output will grow.
                                                                                                 [½]

        Potential output vs trend output

        Trend output shows the trend in actual output, ignoring cyclical fluctuations.   [½]

        If, on average, over the cycle, the economy works with a 'normal' utilisation of capacity, then the
        trend output line will be the same as the potential output line *ie* the gap will be zero. [½]

        However, if, on average, over the cycle, the economy works with a lower/higher than 'normal'
        utilisation of capacity, then the trend output line will be below/above the potential output
        line.   [½]
                                                                                            [Total 4]

12.3   Option B. An increase in the availability of land will increase economic growth because land is an input into an economy's production function. An increase in the provision of nursery education represents (in time) an improvement to a country's labour inputs. An increase in investment may lead to an increase in productivity. However, higher marginal rates of taxes may lead to *lower* economic activity because there is less incentive for individuals to work hard and for firms to invest.   [1½]

12.4   Claimant unemployment is based on the number of people in receipt of unemployment-related benefits.   [½]

The standardised unemployment rate is internationally recognised and is derived from the results of a national labour force survey.   [½]

People are classed as unemployed if:

- they are of working age, and   [½]

- they are without work and they are available to start work within two weeks, and   [½]

- they are actively seeking employment or waiting to take up an appointment.   [½]

The standardised unemployment rate includes people who are unemployed but ineligible for unemployment benefit, …   [½]

… whereas the claimant rate includes those who are claiming benefits but who are not actively seeking work.   [½]

The standardised unemployment rate is generally higher than the claimant rate.   [½]

[Maximum 3]

12.5   Costs of unemployment include the following:

- *direct financial cost to the individual* of the loss of earnings   [½]

- *personal costs to the individual,* including:
  - loss of self-esteem   [½]
  - an increase in stress-related illness   [½]

- *costs to family and friends*, including a loss of income …   [½]

  … and strained relationships / domestic violence / relationship breakdowns   [½]

- an *opportunity cost to the wider economy* in terms of lost output   [½]

- a *loss of tax revenue for the government* – as income and corporation tax receipts decrease as a result of job losses and a reduction in corporate profits   [½]

- a *worsening of the government's budget position* as a result of the decrease in revenue and increase in expenditure on healthcare, social services, the police *etc*   [½]

- *lower profits for firms* as a result of output being lower than if employment was higher [½]

- *lower incomes for other workers* as a result of firms producing less output   [½]

- a *decrease in potential output* as a result of the long-term unemployed losing their skills

[½]

- *higher crime levels*, which is a cost to the victims of crime and other members of society.

[½]

[Maximum 5]

12.6   Unemployment is presumably beneficial to these individuals, since they selected it …   [½]

… for example, it may enable them to have sufficient time to search for a new, better job …   [½]

… the benefits from which they hope will exceed the temporary loss of income.   [½]

The economy may benefit from the adaptability and flexibility of such workers …   [½]

… for example, these workers will help to ensure an efficient allocation of resources across the economy …   [½]

… which should aid economic growth in the long run.   [½]

[Total 3]

12.7   Option B. *Structural unemployment* is caused by changes in the pattern of demand or supply in the economy, *eg* the decline of the car industry and the expansion of the entertainment industry. The unemployed car workers may not be able to take up work in the expanding entertainment industry because they lack the necessary skills.   [1½]

12.8   Option B. Option B will help to reduce *frictional unemployment*, which is a component of equilibrium unemployment. Option A would make it *less* worthwhile for the unemployed to seek work. Options C and D would lead to changes in the level of aggregate demand, but not necessarily a reduction in the equilibrium rate of unemployment.   [1½]

12.9
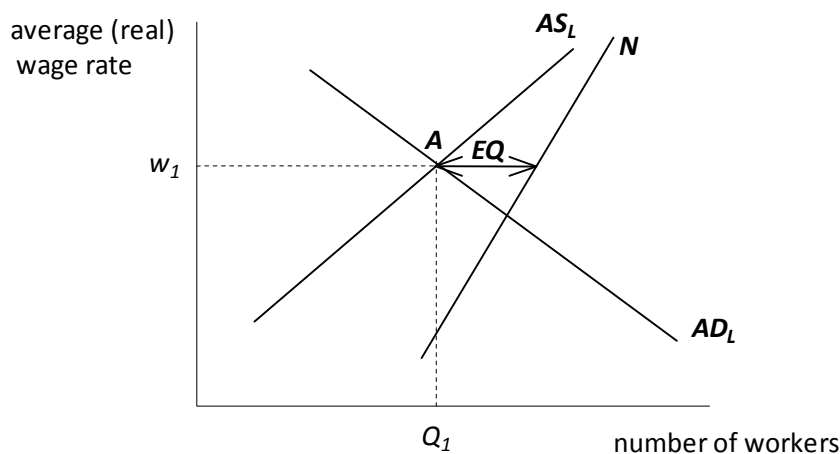
[1 for each part of the diagram drawn correctly as specified in question]

[Total 3]

12.10   Option D.

Cost-push inflation is caused by persistent increases in the costs of production independent of the level of aggregate demand.

Possible sources of cost-push inflation include an increase in raw materials costs (Option A), increases in wages in excess of productivity increases (Option B) and an increase in profit margins applied by firms (Option C).

An increase in consumer spending increases aggregate demand, which may lead to *demand-pull inflation*, not cost-push inflation. So Option D is the correct answer.   [1½]

12.11   *This question is Subject CT7, September 2013, Question 35.*

Demand-pull inflation

Demand-pull inflation occurs when there is a persistent increase in the level of aggregate demand so that prices are bid up.   [½]

The cause could be an increase in any component of aggregate demand.   [½]

For example, greater consumer and business confidence could lead to an increase in consumption and investment.   [½]

The increase in aggregate demand causes the *AD* curve to shift to the right.   [½]

As can be seen in the diagram below, this will cause an increase in the price level and an increase in output and employment.   [½]

The impact on the price level is greater, the more inelastic the aggregate supply, *ie* the closer the economy is to full capacity, Y_F .   [½]
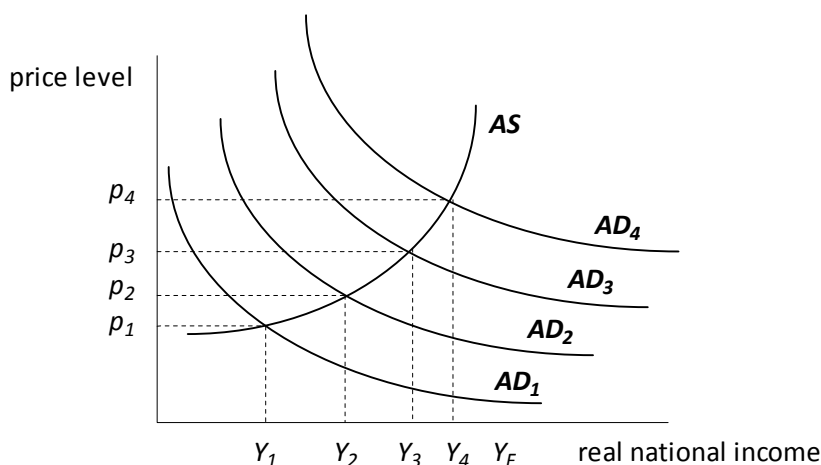
[1 mark for diagram]

Cost-push inflation

Cost-push inflation occurs when there is a persistent increase in firms' production costs, independent of the level of aggregate demand.   [½]

As firms tend to pass on at least part of the increase to consumers through higher prices, the average price level can therefore be 'pushed' up by the increase in costs.   [½]

The cause could be any increase in costs that is not due to an increase in demand. For example, an increase in the price of raw materials, an increase in wages above increases in productivity or an increase in profit margins.   [½ mark per example, maximum 1]
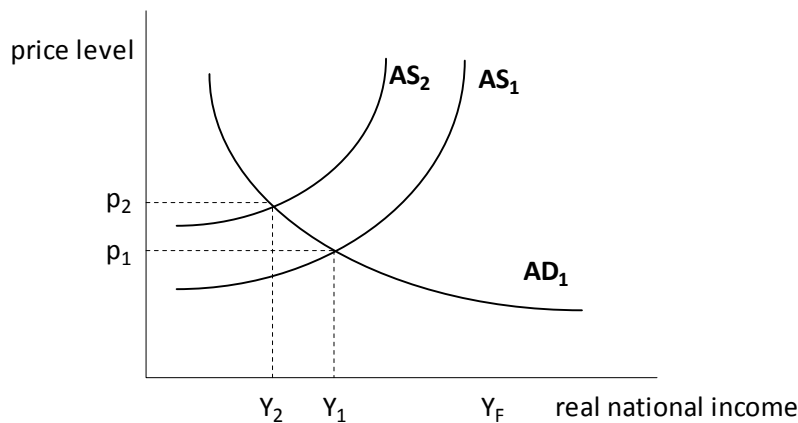
[1 mark for diagram]

The increase in costs causes the AS curve to shift to the left (or upwards). The price level increases and output and employment decrease.   [½]

It is important to establish the source of the cost increases – rises in costs that are due to increases in demand are not an example of 'cost-push' inflation.   [½]

For a given rise in costs, cost-push inflation will be higher when the AD curve is steeper, which typically corresponds to a lower level of real national income.   [½]

[Maximum 6]

13

International trade and payments

Syllabus objectives

3.3   Discuss globalisation and multinational business.

   1.   Describe what is meant by globalisation and its impact on business.

   2.   Explain what is driving the process of globalisation and whether the world benefits from globalisation of business.

3.4   Discuss the importance of international trade.

   1.   Describe the growth of international trade and its benefits to countries and firms.

   2.   Explain the advantages of specialisation.

   3.   Discuss the arguments for trade restriction and protection of domestic industries.

   4.   Explain the role of the World Trade Organisation (WTO) in international trade.

Syllabus objectives continued

3.6   Discuss what is meant by the balance of payments and how exchange rates are determined.

1.   Describe what is meant by 'the balance of payments' and how trade and financial movements affect it.

2.   Explain how exchange rates are determined and how changes in exchange rates affect business.

3.   Explain the relationship between the balance of payments and the exchange rates.

Core Reading

Chapter 15 (Section 7)   *Pages 478–485*

Chapter 24 (Sections 1 and 2)   *Pages 746–771*
        (excluding the intermediate analysis of gains from trade on page 758–759)

Chapter 26 (Box 26.5)   *Pages 852–853*

From the textbook:

   Economics for Business. Sloman, J., Garratt, D., Guest, J., Jones, E. 7th ed. Pearson 2016, which students can access via the ebook (MyiLibrary) service using their Athens password:
   http://lib.myilibrary.com?id=926627&ref=Athens

Chapter 23 (Section 1)   *Pages 418–420*

0   Introduction

In Section 1 of this module, we briefly consider the nature of globalisation, the drivers of globalisation and its possible merits.

However, the main focus of this module is trade. In Section 2 we explore the importance and theoretical advantages of international trade, and in Section 3 we discuss possible reasons to restrict trade.

Finally, in Section 4 we consider the balance of payments and exchange rates.

Much of the material in this module appeared in Subject CT7, where it was examined frequently. It is therefore important to know and understand it thoroughly.

1 Globalisation: setting the scene

1.1 What's included in this section

- Defining globalisation

- What drives globalisation?

- Globalisation: the good and the bad

1.2 Guidance

Globalisation can be summarised as the process of developing increasing political, cultural, financial and economic ties between people, companies and other institutions all around the world.

Table 23.1 is a useful summary of the drivers of globalisation; it is important to learn at least the main categories and a couple of examples of each.

1.3 Reading

Task	√ *when completed*
Read Economics for Business, Chapter 23, pages 418–420. *(See page 2 for access details.)*	☐

1.4 Checklist

Task	√ *when completed*
Ensure that you can:	
• outline how global production of goods and services has evolved	☐
• define what is meant by the term globalisation	☐
• outline, and give examples of, the four main drivers of globalisation	☐
• discuss the benefits and costs of globalisation.	☐

1.5   Questions

Question

Which of the following is NOT one of the main drivers for the potential globalisation of an industry?

A   market drivers
B   government drivers
C   strategic drivers
D   cost drivers

Solution

Option C. The four main drivers for the potential globalisation of an industry are market, cost, government and competitive drivers.

2   The advantages of trade

2.1   What's included in this section

- The growth of world trade

- Specialisation as the basis for trade

- The law of comparative advantage

- The gains from trade based on comparative advantage

- International trade and its effect on factor prices

- Increasing opportunity costs and the limits to specialisation and trade

- The terms of trade

- Other reasons for gains from trade

- The competitive advantage of nations

2.2   Guidance

The start of this section contains lots of facts and figures about trade around the world. Such figures may be interesting, however it is more important to be aware of the principal patterns and trends than the detailed figures. Box 24.1 gives a brief overview of some such trends.

The concept of *opportunity cost* is central to the law of comparative advantage. Recall that the *opportunity cost* of producing one unit of a good (*eg* Good X), is determined as the number of units of production of another good (Good Y) that are sacrificed in order to produce that unit.

When trying to understand absolute and comparative advantage, it might be best to attempt a question: it's easy to get confused when trying to follow the text as to who has which advantage, so having a go at working an answer out might be helpful. Indeed, the exam is more likely to test your *understanding* of the theory than your *knowledge* of straightforward bookwork.

Box 26.5 provides an insight into how China's comparative advantage has changed over recent years, and how it is likely to evolve in the future.

Most of this section is comprised of material that has been part of the economics course for many years. International trade and absolute and comparative advantage have been frequently examined.

2.3   Reading

Task	√*when completed*
Read Chapter 24, pages 747–761, excluding intermediate analysis of gains from trade on pages 758–759.	☐
Read Chapter 26, Box 26.5, pages 852–853.	☐

2.4   Checklist

Task	√ *when completed*
Ensure that you can:	
• define the following key terms:	
– absolute advantage (*AA*)	☐
– comparative advantage (*CA*)	☐
– law of comparative advantage	☐
– terms of trade	☐
• outline the principal patterns and trends in the volume and value of goods and services traded internationally over recent decades	☐
• describe the benefits of specialisation	☐
• determine who has an *AA*	☐
• calculate opportunity cost and use it to determine who has a *CA*	☐
• draw production possibility curves to illustrate the gains from trade if opportunity cost is constant	☐
• demonstrate that trade between two countries can increase the total production and consumption of both countries	☐
• explain why a country experiences increasing opportunity costs and state three other limits to trade	☐
• describe what is meant by an 'improvement' in the terms of trade	☐
• use the terms of trade and opportunity cost ratio to determine when a country would gain by increasing specialisation and trade	☐
• explain the influence of elasticities on the size of a country's gains from trade	☐
• describe the reasons why a country may gain from trade	☐
• state how the abundance of resources affects a country's *CA* and describe four other key reasons why countries are competitive in the production of some products but not others	☐
• outline what is meant by the competitive advantage of nations	☐
• explain why China has a *CA* in the production of labour-intensive manufactured goods and how this *CA* may change in the future.	☐

2.5   Questions

Question

List factors of production that may cause one country to have a comparative advantage over another.

Solution

The factors of production that may lead to a comparative advantage include:

*   the quantity of labour (population density)

*   the quality of labour (labour skills)

*   climate

*   land

*   raw materials

*   capital equipment.

Question

When a country has a comparative advantage in the production of a good it means that the country:

A   can produce the good in fewer labour hours than other countries.
B   has a lower opportunity cost in the production of the good than other countries.
C   can produce a better quality good than other countries.
D   uses more technology to produce the good than other countries.

Solution

Option B.

Note that Option A describes *absolute advantage*.

Question

The table below shows the quantities of cars and bicycles that one unit of input can produce in the UK and the USA. Assume that these are the only two goods that the countries produce.

	One unit of input produces:	
	Bicycles	*Cars*
UK	20	2
USA	30	4

Given the table above, which of the following is true?

A   The USA is likely to export bicycles to the UK.
B   The UK has an absolute advantage in the production of bicycles.
C   The USA has a comparative advantage in the production of bicycles.
D   The USA has an absolute advantage in the production of bicycles.

Solution

Option D.

As the USA can produce more units of each good per unit of input, it can produce both goods at a lower cost. It thus has an absolute advantage in both goods, so Option D is correct.

The UK has a comparative advantage in bicycles because the UK's opportunity cost of bicycles is only 2/20 cars compared with the USA's opportunity cost of 4/30. Conversely, the USA has a comparative advantage in cars, as its opportunity cost is 30/4 compared to 20/2 for the UK. The USA is therefore likely to export cars to the UK in return for imports of bicycles.

Question

(i)   Last year the UK's terms of trade was 120. This year the terms of trade is 115. Is this change favourable or unfavourable to the UK?

(ii)   Will an increase in the value of sterling improve or worsen the UK's terms of trade?

Solution

(i)   A fall in the terms of trade means that more domestically produced goods have to be sacrificed in order to obtain a unit of imported goods. This is *unfavourable*.

(ii)   An increase in the value of sterling will not directly affect export prices in sterling. Imports will become cheaper in sterling terms (fewer pounds needed to buy goods from abroad). Thus the terms of trade will increase. This represents an *improvement* in the terms of trade (fewer British goods have to be sacrificed as exports for each good imported).

3   Arguments for restricting trade

3.1   What's included in this section

- Methods of restricting trade

- Arguments in favour of restricting trade

- Problems with protection

- The World Trade Organisation

3.2   Guidance

Box 24.4 illustrates how the environment might not benefit from free trade, highlighting the importance of *external* benefits and costs.

Box 24.5 considers strategic trade theory, which is a topical issue in the current global economic climate.

Box 24.7 gives some arguments against trade that are commonly heard when trade is discussed in the news, for example, during the 2016 Brexit campaign in the UK. It illustrates, however, that these arguments don't always hold.

Figure 24.12 illustrates the costs of imposing a tariff. The diagram is quite tricky, but the examiners have tested knowledge of this graph several times over recent years, so it's well worth knowing it.

3.3   Reading

Task	√when completed
Read Chapter 24, pages 761–771.	☐

3.4 Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– *ad valorem* tariffs	☐
– dumping	☐
– infant industry	☐
– strategic trade theory	☐
– optimum tariff	☐
• describe the eight methods of restricting trade	☐
• explain the arguments in favour of restricting trade, specifying which arguments would be part of strategic trade theory	☐
• discuss why free trade based on free-market prices may have an adverse impact on the environment	☐
• set out examples of situations in which supporters of strategic trade theory would suggest trade should be restricted	☐
• outline the arguments against strategic trade theory	☐
• explain the problems with protection	☐
• explain, with the aid of a diagram:	
– how a country that has a monopoly on supply of a good can set the level of an export tax to maximise profits	☐
– how a country that has monopsony power in the demand for an import can set the level of import tariff to maximise its gain from trade	☐
– why the imposition of a tariff can result in a net cost to society	☐
• set out the key features of the World Trade Organisation (WTO) and the five key WTO rules.	☐

3.5   Questions

Question

Which of the following are barriers to trade designed to protect a nation's domestic industries?

I   tariffs on imports
II   restrictions on the amount of goods that the nation can export
III   excessive paperwork for imported goods

A   I and III
B   I, II and III
C   I only
D   III only

Solution

Option A. Restrictions on the amount of goods that can be *imported* would help protect a nation's domestic industries. Both tariffs and excessive paperwork would achieve this.

Question

Which of the following is NOT a reason to restrict international trade?

A   to protect infant industries
B   to reduce reliance on goods with little dynamic potential
C   to prevent the dumping of goods at artificially low prices
D   to increase the speed at which outdated industries decline

Solution

Option D. International competition may put outdated industries out of business very quickly. The government may restrict trade to *decrease* the speed at which outdated industries decline in order to reduce structural unemployment.

Question

Governments might set up barriers to international trade in order to protect domestic industries. Explain eight potential problems with protectionism.

Solution

1. *Increase in prices and reduction in choice* – protection will tend to increase the price of goods and restrict the choice of goods available.

2. *Loss of welfare* – Introducing a tariff on imports will also lead to a net welfare loss, as the loss of consumer surplus due to the higher prices and the lower quantity consumed will outweigh the increased (domestic) producer surplus and the tax revenue raised.

3. *'Second best' solution* – protection may be only the second-best course of action for a government to solve certain problems. For example, a programme of retraining may be a better solution to the problem of a declining industry than protection through tariffs on imports.

4. *Multiplied loss of income* – a reduction in the rest of the world's exports to the domestic country will reduce injections into the rest of the world's economy and, as a result of the multiplier, will lead to a significant fall in the rest of the world's income. This in turn will decrease demand for the domestic country's exports.

5. *Retaliation* – if Country X imposes tariffs on Country Y, then Country Y is likely to retaliate with tariffs also. The overall effect is reduced trade, leading to higher costs and less choice for consumers in both countries.

6. *Inefficiencies* – protection may be needed for infant industries. However, there is a danger that these industries will remain inefficient if they are not exposed to international competition.

7. *Bureaucracy* – there can be large, bureaucratic, administrative costs involved in enforcing the barriers and checking that the government's protection policies are meeting their aims.

8. *Corruption* – domestic industries and importers will be tempted to bribe the officials responsible for determining the barriers to international trade to introduce favourable policies and therefore corruption may occur.

4   The open economy

4.1   What's included in this section

- The balance of payments account

- Exchange rates

- The determination of the rate of exchange in a free market

- Exchange rates and the balance of payments

4.2   Guidance

Historically, knowledge of the components of the balance of payments accounts has been tested in multiple-choice, short-answer and long-answer questions. The questions have sometimes involved calculations. It is therefore important to be very familiar with each item in the account.

Components of the account that often lead to confusion are:

- 'current transfers of money' in the current account: broadly speaking, this is a transfer of money that occurs when one party provides money to another, without expecting anything in return, *eg* a donation of money to provide aid to victims of a natural disaster overseas

- some items in the capital account (*eg* the transfer of funds by migrants): these may seem similar to some of the items that would go in the current transfers sub-section of the current account (above); the main distinction here is time frame – the current account includes funds that are likely to be used for *consumption* in the short term (*ie* less than a year), whereas the capital account typically relates to funds with a longer-term purpose.

Exchange rates are introduced in this section. Further detail of exchange rates will be given in Module 21, Exchange rate policy.

4.3   Reading

Task	√when completed
Read Chapter 15, pages 478–485.	☐

4.4 Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– open economy	☐
– balance of payments account	☐
– current account of the balance of payments	☐
– trade in goods account	☐
– trade in services account	☐
– balance on trade in goods / balance of visible trade / merchandise balance	☐
– balance on trade in goods and services / balance of trade	☐
– balance of payments on current account / current account balance	☐
– capital account of the balance of payments	☐
– financial account of the balance of payments	☐
– exchange rate index	☐
– arbitrage	☐
– floating exchange rate	☐
– depreciation	☐
– appreciation	☐
• identify and describe each of the components in the balance of payments account	☐
• understand how to determine whether an item in the balance of payments account will be positive or negative	☐
• state what is meant by an exchange rate and explain how exchange rates are determined in a free market	☐
• sketch supply and demand curves for a currency	☐
• explain the six major possible causes of an exchange rate depreciation or appreciation	☐
• explain how the balance of payments will automatically balance without intervention in a free foreign exchange market.	☐

4.5   Questions

Question

Which of the following would give rise to a '+' in the USA's balance of payments?

A   The US Federal Reserve Bank increases its gold reserves.
B   The dollar exchange rate moves from $1.70/£1 to $1.50/£1.
C   A Japanese car manufacturer buys all the shares in a American car manufacturer.
D   The price of exports rises.

Solution

Option C.

Option A: if the Federal Reserve Bank buys more gold, it will be *increasing* the *supply of dollars*, which would be recorded as a '–' in the balance of payments.

Option B: an increase in the sterling value of the dollar will not *directly* affect the balance of payments *now*, although it may influence the *subsequent* volume and value of exports and imports to and from the USA.

Option C: this will be recorded as a '+' in the financial account.

Option D: as with Option B, there will be no *direct* effect on the balance of payments. The *subsequent* effect will depend on the elasticity of demand for US exports.

Question

The following transactions occurred in respect of Country X's trade with the rest of the world during one year:

- Cars worth £10,000 were exported.

- Perfume worth £5,000 was imported.

- Oil worth £700 was exported.

- Foreign tourists spent £3,000 in Country X.

- Dividends from overseas companies totalling £500 were received.

- Country X donated £1,000 to developing countries for current expenditure.

- Overseas shares and bonds worth £700 and £150 respectively were purchased.

- Hot money worth £70 was deposited into Country X.

- Reserves of gold and foreign currency were increased by £7,600.

- Net errors and omissions were +£20.

Assuming that there were no other transactions, calculate (in sterling terms) the country's:

(i)   visible trade balance

(ii)   balance of trade

(iii)   current account surplus or deficit

(iv)   financial account surplus or deficit

(v)   capital account surplus or deficit.

Solution

(i)   10,000 – 5,000 + 700 = £5,700 (surplus)

(ii)   5,700 + 3,000 = £8,700 (surplus)

(iii)   8,700 + 500 – 1,000 = £8,200 surplus

(iv)   – 700 – 150 + 70 – £7,600 = –£8,380, *ie* £8,380 deficit

(v)   Note that the current account, capital account, financial account, and net errors and omissions item must sum to zero. So:

        8,200 + capital account – 8,380 + 20 = 0

        Therefore, the capital account = £160 surplus

Question

Consider the effect of each of the following on the demand for £ and/or the supply of £ and hence on the value of the £:

(i)   an improvement in technology in the UK resulting in an increase in the demand for UK goods

(ii)   an increase in the UK rate of inflation (relative to that in other countries)

(iii)   an increase in UK interest rates

(iv)   the discovery of precious stones in the UK

Solution

(i)   Technological improvements make UK goods cheaper and more attractive. There will be an increase in the demand for £s as foreigners wish to buy more UK goods and also a fall in the supply of £s as UK citizens decrease their demand for foreign goods and buy UK goods instead. Thus the value of the £ will *rise*.

(ii)   An increase in UK inflation (relative to that in other countries) makes UK goods less competitive. Thus the demand for £s falls and the supply of £s rises. The value of the £ will *fall*.

(iii)   An increase in UK interest rates makes it more attractive to save in the UK. There will be an increase in the demand for £s from institutions and foreign citizens abroad, and a decrease in the supply of £s from UK institutions and citizens who would prefer to deposit their money domestically. The value of the £ will *rise*.

(iv)   The discovery of precious stones in the UK will ultimately lead to an improvement in the visible balance as the precious stones are exported. In the short run, the discovery might also attract capital into the country as firms invest in the new industries, *ie* there will be an increase in the demand for £s as the capital comes into the country. In addition, there might be some speculative activity as speculators buy £s in the expectation that it will rise as the new resource is exploited. The value of the £ will therefore *rise*.

Question

Describe how a floating exchange rate will automatically move to address a current account deficit so that the balance of payments balances.

Solution

Under a floating exchange rate, if there is a current account deficit, then the supply of the domestic currency will exceed demand for it, and the exchange rate will fall. This will make it cheaper to invest in the domestic economy and so there will be an increase in the net inflow to the financial account. So the current account deficit will be matched by a surplus in the financial account, ensuring an overall balance.

The practice questions start on the next page so that you can
keep the practice questions and solutions together for revision purposes.

Module 13 Practice Questions

13.1 Describe the four main drivers of the process of globalisation.   [4]

Exam style

13.2 Discuss who gains and who loses as markets become continually more globalised.   [4]

Exam style

13.3 Outline the benefits of international trade.   [5]

Exam style

13.4 Suppose there are just two countries, A and B, and the only factor of production is labour. In Country A it takes 10 hours to produce one unit of Good X and 2.5 hours to produce one unit of Good Y. In Country B it takes 15 hours to produce one unit of Good X and 7.5 hours to produce one unit of Good Y.

Exam style

   (i)   State which country has a comparative advantage in the production of Good X.   [1]

   (ii)   State which country has an absolute advantage in the production of Good X.   [1]

   (iii) State whether international trade will take place between the two countries if the terms
          of trade were one unit of Good Y for one unit of Good X.   [1]
                                                                                    [Total 3]

13.5 P_x / P_m is the terms of trade and MC_x / MC_m is the opportunity cost ratio for a country. The country will have maximised the gain from specialisation and trade when:

Exam style

   A $P_x / P_m < MC_x / MC_m$
   B $P_x / P_m > MC_x / MC_m$
   C $P_x / P_m = MC_x / MC_m$
   D $P_x / P_m = 1$ [1½]

13.6 Explain the argument behind strategic trade theory.   [5]

Exam style

13.7 Explain the role of the World Trade Organisation (WTO) in international trade.   [4]

Exam style

13.8   Following the imposition of a tariff:

Exam style

A   the consumer surplus increases, the producer surplus increases and the government surplus increases.

B   the consumer surplus increases, the producer surplus increases and the government surplus decreases.

C   the consumer surplus decreases, the producer surplus increases and the government surplus increases.

D   the consumer surplus decreases, the producer surplus decreases and the government surplus increases.   [1½]

13.9   Which of the following would NOT appear in the UK's balance of trade?

Exam style

A   exports of cars from the UK
B   spending by UK tourists in Portugal
C   insurance premiums paid to Lloyds of London by Panamanian ship owners
D   debt forgiveness by the UK government   [1½]

13.10 The following table contains figures extracted from a country's balance of payments for 201X:

Exam style

Exports of economics courses paid for in 201X	$5m
Imports of paper	$3m
Exports of courses on credit (payment due on 30 June 201X+1)	$1.5m
Spending by economics tutors on trips abroad	$0.3m
Spending by economics students visiting the country	$1.2m
Repayment of loan from domestic tuition provider to foreign bank	$1m
Purchases of shares in overseas economics tuition providers	$0.8m
Net errors and omissions item	+$0.04m

Calculate the following items for the country:

(i)   balance of trade   [1]

(ii)   current account balance   [1]

(iii)   financial account balance (investment and other financial flows only)   [1]

(iv)   financial account balance (including reserves)   [1]

(v)   change in official reserves.   [1]
                                                                                                 [Total 5]

13.11 Which of the following is most likely to result from the depreciation of a country's exchange rate?

Exam style

A   Exports will become less competitive.
B   Imports will become cheaper.
C   Inflation will rise.
D   Import volumes will rise.   [1½]

13.12   The country of Vespasia allows its currency, the Vespasian dollar ($), to float freely.

Exam style   What are the factors that determine the value of its exchange rate?   [8]

The solutions start on the next page so that you can
separate the questions and solutions.

📋 Module 13 Solutions

13.1   The main drivers for the potential globalisation of an industry are:

- *market drivers* – reflecting the fact that markets globally are becoming more similar, *eg* increasing similarity in consumers' incomes and tastes   [1]

- *cost drivers* – reflecting the potential for reducing production costs (via factors such as outsourcing) and advances in transportation / distribution   [1]

- *government drivers* – reflecting beneficial policies such as trade agreements, the encouragement of inward investment, and the establishment of global rules and protocols   [1]

- *competitive drivers* – reflecting how increased domestic and global competition leads firms to adopt global business strategies.   [1]

[Total 4]

13.2   *This question is Subject CT7, October 2015, Question 33.*

Firms may gain through globalisation due to:

- increased opportunities for specialisation and the exploitation of economies of scale, leading to increased production of goods and services, lower average costs and higher profits   [1]

- the faster diffusion of new technology, which may enable them to produce goods more cheaper and hence more profitably.   [½]

Individuals may gain through globalisation due to:

- greater competition, which leads to lower consumer prices   [½]

- a wider range of goods available for consumption   [½]

- greater cultural exchange, resulting in non-financial benefits, as they get to experience food, music *etc* from different countries and cultures   [½]

- increased investment in developing countries, leading to growth and improvements in living standards there.   [½]

Globalisation may also lead to closer political ties and hence greater political stability, to the benefit of both individuals and firms.   [½]

However, *individuals in certain countries* may lose out if globalisation:

- contributes to growing inequalities between countries by making poor countries even poorer as multinationals exploit their dominant position in foreign markets (*eg* by cutting wages further)   [½]

- contributes to environmental problems, as rapid growth and increased transportation cause pollution and the depletion of natural resources   [1]

- leads to political, economic and cultural domination by large, multinational brands.   [½]

[Maximum 4]

13.3   International trade allows countries to specialise in the production of the goods that they can produce relatively more efficiently than other countries. In doing so, international trade allows the world's resources to be used in a more economically efficient way.   [1]

International trade increases the scope for benefits from economies of scale by increasing the size of the available markets.   [1]

Trade increases the range of goods and services that consumers can buy.   [½]

Countries can trade goods for which supply exceeds demand, which may be more efficient than switching production to other goods.   [1]

International trade may lead to increased competition and hence lower prices, greater investment in research and greater efficiency.   [1]

Exporting nations will experience growth as the world economy grows, especially if these exports have a high income elasticity of demand.   [1]

There may be political, social and cultural advantages to trade.   [½]

[Maximum 5]

13.4   (i)   The opportunity cost of Good X for Country A is 4 units of Good Y and the opportunity cost of Good X for Country B is 2 units of Good Y. So, Country B has the comparative advantage in the production of Good X.   [1]

(ii)   Country A takes fewer hours of labour to produce Good X than Country B and so enjoys an absolute advantage.   [1]

(iii)   The opportunity cost of Good Y for Country A is ¼X. Consequently, Country A will be willing to trade Good Y for Good X only if it receives more than ¼X for each Y it exports. In other words, Country A will need to receive more than 1X for every 4Y it trades. Equivalently, it will be willing to give up fewer than 4Y for each X it receives.

Likewise, the opportunity cost of Good X for Country B is 2Y and so Country B will be willing to trade Good X for Good Y only if it receives more than 2Y for each X it exports.

So, the terms of trade at which both countries will gain from trade lie within the range 1X for fewer than 4Y and 1X for more than 2Y.

As the proposed terms of trade is 1X for 1Y, which lies outside of this range, no trade will take place.   [1]

13.5   Option C.

If the terms of trade is greater than the opportunity cost ratio *ie* $P_x / P_m > MC_x / MC_m$ (Option B), it will benefit the country to produce more exports in return for imports, since the relative value of production is greater than the relative cost.

As more exports are produced, opportunity costs will increase until the relative value of production is equal to the relative cost *ie* $P_x / P_m = MC_x / MC_m$ (Option C). At this point, there can be no more gain from further specialisation and trade.   [1½]

13.6   *Strategic trade theory* argues that governments should protect and support certain domestic industries to enable them to compete more effectively with large monopolistic rivals that are based abroad.   [1]

The government support may allow a domestic industry to develop to a point where it has a comparative advantage.   [½]

Protecting certain industries should lead to a net gain in the *long run* from increased competition in the market.   [½]

This argument is used to justify:

- protectionist support for infant industries that are too small as yet to benefit from economies of scale   [1]

- temporary subsidies to enable established industries to modernise to compete effectively with importers   [½]

- the expansion of new industries and the reduced reliance on primary products that have a low income elasticity of demand (*ie* those that are income-inelastic)   [1]

- protection from unfair trade practices, *eg* the dumping of subsidised exports   [1]

- the prevention of the establishment of a foreign-based monopoly   [½]

- retaliation if a foreign government introduces protectionist policies – with the aim of persuading the foreign government to withdraw its protection.   [1]

[Maximum 5]

13.7   The WTO aims to reduce trade restrictions so that all countries gain from the benefits of free trade.   [1]

Approximately 160 countries are members of the WTO (accounting for 98% of world trade), therefore this gain can be significant.   [1]

Members of the WTO meet in a series of trade rounds to discuss ways to reduce barriers to trade.   [½]

They must abide by a number of rules designed to reduce barriers to trade.   [½]

Disputes between members are settled by the WTO.   [½]

Sanctions can be imposed on countries breaking trade agreements.   [½]

[Total 4]

13.8   Option C. The imposition of a tariff increases the price to the consumers, so the consumer surplus decreases. The producers receive the higher price and extend their supply, so the producer surplus increases. The government receives revenue from the tariff on imported goods, so the government surplus increases.   [1½]

13.9   Option D. The balance of trade includes exports and imports of goods and services. Option D is a transaction that would appear in the capital account.   [1½]

13.10   (i)   Balance of trade = 5 – 3 + 1.5 – 0.3 + 1.2 = + $4.4*m*   [1]

        (ii)   Current account balance = + $4.4*m*   [1]

        (iii)   Financial account (investment and other flows) = – 1.5 – 1 – 0.8 = – $3.3*m*   [1]

        (iv)   Financial account balance = – (4.4 + 0.04) = – $4.44*m*   [1]

        (v)   Change in official reserves = – 4.44 – (–3.3) = – $1.14*m*   [1]

Note that the item 'Exports of courses on credit' should add nothing to the overall balance of payment account as no money will change hands until 201X + 1. However, it will appear within the accounts to reflect that the trade (of courses) has taken place.

Payment for goods and services on credit is treated as a (short-term) loan from the exporting country to the importing country. Hence, the $1.5m is treated as a positive in the balance of trade (to reflect the fact that exports of $1.5m have taken place) and simultaneously a negative in the financial account (to reflect the fact that the country has effectively loaned the importer of the courses $1.5m until 30 June 201X + 1).

13.11   Option C. *Depreciation* means that the domestic currency will now be worth *less* in terms of the overseas currency it can buy, therefore exports will become *more* competitive and imports will become more *expensive*, which is likely to *decrease* the volume of imports. However, inflation is likely to rise through cost-push pressures (more expensive imports) and demand-pull pressures (an increased demand for (cheaper) exports).   [1½]

13.12   The exchange rate of the $ is the price of the $ in relation to other currencies. The exchange rate is determined by supply and demand for the currency. An increase in the supply of $s or a fall in the demand for $s will make the $ depreciate (*ie* fall in value) relative to other currencies.   [1]

        The supply of $s comes primarily from:

        •   imports of goods and services   [½]

        •   Vespasian investment overseas   [½]

        •   the Vespasian government selling $s (in order to buy foreign currency and gold
                reserves).   [½]

        Similarly, demand comes mostly from exports, foreign investment in Vespasia and foreign governments buying $s (in return for reserves of gold and other currencies).   [½]

        Under a freely floating exchange rate, official intervention in the foreign exchange markets is zero and so cannot affect the value of the currency.   [½]

        If Vespasia produces better quality products at more reasonable prices, it will find it easier to export, and imports will become relatively less attractive. Therefore the current account will tend to move into surplus. There will be an excess demand for $s and the $ will appreciate.   [1]

        If Vespasian prices increase faster than prices in other countries, its exports will become uncompetitive and imports will appear attractively cheap. Therefore the current account will be pushed towards deficit. There will be an excess supply of $s and the $ will depreciate.   [1]

If interest rates in Vespasia increase, savings will flow into the country and Vespasian citizens will save less abroad. The excess demand for $s will increase the value of the $. [1]

An increase in incomes in Vespasia (relative to incomes abroad) will increase demand for imports and hence increase the supply of $s and decrease its value. [1]

If the relative prospects for investment improve in Vespasia, the demand for $s increases and the $ increases in value. [1]

If speculators believe the $ will increase, they will buy $s in anticipation of its rise, which will itself bring about its rise. [1]

[Maximum 8]

14

The financial system and the money supply

Syllabus objectives

1.3   Analyse the recent macroeconomic history.

1.   Describe the progress of the world economy since the Great Depression:
   - a history of banking crises and irrational behaviour
   - consequences of banking crises.

2.   Discuss the banking crisis of 2008, the Great Recession and recovery.

3.7   Discuss the role of money and interest rates in the economy.

1.   Describe the function of money.

2.   Describe what determines the amount of money in the economy, what causes it to grow and what is the role of banks in this process.

3.   Discuss the concept of the money multiplier in the real world.

6.   Explain why central banks play a crucial role in the functioning of economies.

Syllabus objectives

3.8   Discuss the role, structure and stability of the financial system.

1.   Describe the different financial systems.

2.   Evaluate how effectively different financial systems operate, with reference to the UK and China.

3.   Describe the role of the financial markets and how financial markets help to achieve a nation's objectives.

4.   Describe the different participants in the financial markets.

5.   Discuss the development of financial systems and the factors affecting the stability of financial systems.

Core Reading

Chapter 18 (Sections 1 and 2)   *Pages 551–571*

Chapter 18 (Section 3, up to and including the flow-of-funds equation)   *Pages 572–578*

Additional Core Reading

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0   Introduction

The additional Core Reading in Section 1 provides a brief overview of the definition, role and evolution of financial systems.

Section 2 then looks in detail at the financial system, and in particular, the important role played by banks, including the central bank. It discusses the functions of banks, the main one of which is to accept deposits from savers, *ie* to borrow from them, and then to lend the money deposited to borrowers. In doing so, they need to ensure they have sufficient *liquidity* and *capital*, otherwise they can run into problems.

Some of the causes of, and responses to, the financial crisis of 2008 are also covered in Section 2, before the additional Core Reading in Section 3 provides a more general discussion of banking crises.

Section 4 covers the meanings and functions of money, the main one of which is as a means of paying for goods and services.

Finally, Section 5 looks at the process of borrowing and lending by banks and the resulting creation of credit, both in theory and also in the real world.

The material in this module is useful background information for the module that follows. It builds on many of the themes discussed in this one and looks at monetary policy, which is concerned with interest rates and the control of the money supply.

Apart from the additional Core Reading, most of the material in this module appeared in Subject CT7.

1   The definition, role and evolution of financial systems

This section of additional Core Reading outlines the definition and role of financial systems and their recent evolution. This material is entirely new to Subject CB2.

1.1   The definition and role of financial systems

A financial system consists of:

- **money**
- **the financial market**
- **banks**
- **financial institutions and instruments**

each contributing to the system's functions – transferring funds from individuals, firms, institutions and governments with a surplus of funds to those agents with a deficit.

The meanings and functions of money are covered in Section 4 of this module. Financial markets, financial institutions (including banks) and financial instruments are discussed in detail in Section 2.

Effectiveness of the financial system

Effectiveness of the financial system depends on how well its parts function. Greater investor participation, competition among institutions, lower costs, correct security pricing and fair play in trading are factors that enhance the financial system's effectiveness.

Financial markets

Financial markets where instruments are traded determine the price of the securities and enable allocation of capital. For example, shares and bonds are traded on the London Stock Exchange and futures and options on the London International Financial Futures and Options Exchange (LIFFE).

Lower trading costs and accurate price information promote market efficiency. The electronic systems in large exchanges have reduced the cost of gathering information and transaction costs.

Financial instruments

Financial instruments such as shares, bonds and mortgages transfer resources from savers to investors. Lower transaction costs and a wide range of available instruments have enabled a larger number of investors to participate in the market. For example, mutual funds have created more investment opportunities for small investors.

Mutual funds are investment vehicles in which the contributions of many investors are pooled and used to invest in a portfolio of securities and/or other assets. Examples include unit trusts, investment trusts and open-ended investment companies (OEICs). They enable individual investors to access many different types of investments (*eg* shares, bonds, property and commodities) in many different countries and regions.

Financial institutions

Financial institutions offer a wide range of financial products and services and act as financial intermediaries. Competition between institutions drives down costs and promotes efficiency.

Regulation

Financial systems where investors are protected by regulation and supervision function well. Regulatory and supervisory authorities enforce the rules to protect investors. Governments promote participation in the financial markets by ensuring that it is perceived by investors to be fair. For example, UK regulations prohibit 'insider dealing', *ie* it is illegal to deal in securities on the basis of information that is not public and would affect the securities' prices if it was. The rule ensures that all traders have access to the same information at the same time.

1.2   The evolution of financial systems

Financial systems continue to evolve over time, and the last thirty years, in particular, has seen a major transformation.

This has been facilitated primarily by the enormous increases in computing capacity and capability.

Recent developments in financial systems

The influences of a mature and well-functioning capital market and financial system on the development and growth of an economy has grown substantially. In the UK and other Western economies with deeply developed banking sectors, financial markets and instruments, these changes have included:

- **financial integration**

- **globalisation**

- **deregulation**

- **financial innovation.**

The changes have altered the operation and impact of the financial system on the rest of the economy. Financial integration and globalisation yielded great benefits such as greater productivity, higher liquidity, capital mobility and economic growth. However, these also increased the economies' exposure to systemic risk (problems in the financial system of one country spreading to other countries).

For example, sub-prime lending in the USA also affected banks in many other countries, which led to the global nature of the financial crisis of 2008

In the aftermath of the financial crisis of 2008, financial systems have seen marked changes in their structure and regulation.

The UK financial services industry

The UK financial services industry makes a significant contribution to the UK economy and has been an important driver of economic growth.

In order to promote efficiency in the financial system, in the 1980s the UK government undertook substantial reforms of the banking sector, London Stock Exchange and other financial institutions. Deregulation of the banking sector and the Big Bang (October 1986) removed some of the restrictive pricing practices in the London Stock Exchange, which led to a more competitive environment and enabled both existing and new banks to compete effectively with foreign banks.

A more competitive environment, a higher degree of financial innovation in financial instruments and markets has made London one of the world's most important financial centres. However it is argued that banks' excessive risk-taking, insufficient regulatory constraint and introduction of complex financial products were some of the factors that contributed to the financial crisis of 2008.

Major restructuring of regulatory framework and new regulation after the financial crisis of 2008, was aimed at protecting investors, restoring investor confidence and enhancing future stability of the financial system and the economy.

For example, the measures included strengthening the capital adequacy requirements of banks and introducing new liquidity requirements, such as the net stable funding ratio. These are discussed in Section 2.

China's financial systems

In emerging market countries such as China and India an important factor in achieving high levels of growth has been the development of these countries' financial systems. For example, China, in its move towards a market-oriented economy has undertaken reforms of its banking sector where the main commercial banks are listed on stock exchanges and play a key role in China's economic growth. These reforms have resulted in China's banking sector becoming one of the world's largest. Development of an efficient banking sector together with developing its financial market and financial instruments will enable it to move towards achieving its economic objectives.

Islamic finance

A new development in finance since the 1970s has been the growth of Islamic finance, practised in the Islamic world. Islamic banking complies with Islamic law (called *Sharia*), which prohibits *Riba,* generally interpreted as 'interest on money'.

Riba is also sometimes referred to as *usury*.

In the 1970s, a number of Islamic banks were formed that carried out Sharia-compliant transactions. The number of banks and Islamic institutions has grown since, and Islamic banking is expected to continue its growth into the future.

1.3   Checklist

Task	√when completed
Ensure that you can:	
• state the constituent parts of a financial system	☐
• list the factors that determine the effectiveness of a financial system	☐
• outline the role of each of the following in a financial system:	
– financial markets	☐
– financial instruments	☐
– financial institutions	☐
– regulatory authorities	☐
• outline the evolution of:	
– financial systems in Western economies	☐
– the UK financial services industry since the 1980s	☐
– financial systems in China	☐
– Islamic finance.	☐

1.4   Questions

Question

Which of the following enhances the effectiveness of a financial system?

I   competition among financial institutions
II   insider trading
III   greater investor participation

A   I and II
B   I and III
C   II and III
D   I, II and III

Solution

Option B. Insider trading, based on private information that is not publicly available, is generally prohibited. This is so as to ensure fair trading, which does enhance the effectiveness of a financial system. It also instils greater investor confidence, which should lead to greater investor participation.

2   The financial system

2.1   What's included in this section

- The role of the financial sector

- The banking system

- Deposit taking and lending

- Liquidity, profitability and capital adequacy

- The central bank

- The money markets

2.2   Guidance

This lengthy section describes in detail the typical constituents and main players in a developed financial system, with particular focus on the role of banks, including the central bank. It also:

- covers some of the causes of, and responses to, the financial crisis of 2008. These are revisited later on in the course.

- provides a useful background to understanding monetary policy, which is discussed in Module 15.

The material first covers the main roles of financial institutions, such as banks. Traditionally, banks have made profits by borrowing money from depositors, which they then lend out to borrowers at a higher rate of interest. However, in doing so, they need to ensure they have sufficient:

- *liquidity*, *ie* sufficient cash available to meet their liabilities as they fall due, *eg* when depositors want to withdraw their savings

- *capital*, essentially the surplus of assets over liabilities, to guard against the possibility that their borrowers are unable to repay their loans, resulting in losses to the banks.

In the years leading up to the financial crisis, *securitisation*, *ie* the repackaging and selling on of loans, enabled the banks to increase their lending substantially and hence their profits (see Box 18.3). However, subsequent defaults on these loans, allied with the increased use of wholesale funding (see Box 18.2) and the increased interdependence of the global financial system, were a major cause of the financial crisis of 2008. A key regulatory response to the crisis was to introduce more stringent capital adequacy and liquidity requirements.

In most countries, a key player in the financial system is the central bank, *eg* the Bank of England in the UK. Amongst its many roles, a central bank is typically responsible for regulation of the banking system. Central banks played a key role in the regulatory response to the financial crisis.

Although most of this material appeared in the economics course prior to 2019, it was rarely examined. However, this may not be the case with the Subject CB2 exam, as the course has a greater focus on recent economic history than its predecessor.

2.3   Reading

Task	√when completed
Read Chapter 18, pages 553–571.	☐

2.4   Checklist

Task	√when completed
Ensure that you can: • define the following key terms:	
– financial intermediaries	☐
– maturity transformation	☐
– risk transformation	☐
– retail banking	☐
– wholesale banking	☐
– wholesale deposits and loans	☐
– financial deregulation	☐
– monetary financial institutions (MFIs)	☐
– money market	☐
– financial instruments	☐
– liabilities	☐
– sight deposits	☐
– time deposits	☐
– certificates of deposit (CDs)	☐
– sale and repurchase agreements (repos)	☐
– assets	☐
– market loans	☐
– bills of exchange	☐
– commercial bills	☐
– Treasury bills	☐
– discount market	☐
– gearing or leverage	☐
– co-ordination failure	☐
– bank bills	☐
– reverse repos	☐
– liquidity	☐
– maturity gap.	☐

Task	√when completed
Continued	
Ensure that you can:	
• define the following key terms:	
– liquidity ratio	☐
– secondary marketing	☐
– securitisation	☐
– special purpose vehicle (SPV)	☐
– collateralised debt obligations (CDOs)	☐
– moral hazard	☐
– sub-prime debt	☐
– capital adequacy ratio (CAR)	☐
– macro-prudential regulation	☐
– global systematically important banks (G-SIBs)	☐
– central bank	☐
– open market operations (OMOs)	☐
– operational standing facilities	☐
– reserve averaging	☐
– quantitative easing (QE)	☐
– prudential control	☐
– exchange equalisation account	☐
– capital market	☐
– discount market	☐
– rediscounting bills of exchange	☐
– lender of last resort	☐
• describe the five main services provided by financial intermediaries	☐
• outline the roles of retail banks, wholesale banks and building societies	☐
• describe the liabilities and assets of retail banks	☐
• outline the aims of the UK bank levy and how it works	☐
• explain the balance between liquidity and profitability	☐
• explain how secondary marketing can reconcile the conflicting objectives of liquidity and profitability	☐
• explain the process of securitisation	☐
• explain what is meant by capital adequacy and why it is important.	☐

Task	√**when completed**
Continued Ensure that you can: • explain why securitisation can lead to the problem of moral hazard	☐
• discuss the effects of securitisation	☐
• explain the role of securitisation in the financial crisis of 2008	☐
• give examples of regulations introduced to better manage capital adequacy and liquidity in response to the financial crisis	☐
• describe the main functions of the central bank	☐
• explain the ways in which the central bank can provide liquidity, as necessary, to banks	☐
• distinguish between the capital markets and the money markets	☐
• explain the operation of the discount and repo markets and the parallel money markets.	☐

2.5 Questions

Question

Which of the following are assets of a bank?

I   cash
II   repos
III   mortgages

A   I and II only
B   I and III only
C   II and III only
D   I, II and III

Solution

Option B. *Repos* (sale and repurchase agreements) involve a bank selling bonds in return for cash, at the same time agreeing to rebuy the bonds at some future date. They therefore create a financial obligation for the bank and as such are a *liability* of the bank. However, they are an asset of the counterparty, usually the central bank or another bank, which is said to have a *reverse repo* position.

Question

Describe, with the aid of a diagram, the process of securitisation.

Solution

Securitisation is the process of pooling assets, such as loans or mortgages, into marketable securities, such as bonds, backed by these assets. It works as follows:

- A financial institution such as a bank (known as the lender or *originator*) sells some of its assets to an intermediary known as a *special purpose vehicle (SPV)* — a legal entity created by the financial institution for conducting specific financial functions.

- The SPV bundles these assets together and sells them as fixed-income bonds to investors (*eg* other banks). These bonds are known as *collateralised debt obligations (CDOs)* since they are backed by the range of assets bought by the SPV, *eg* corporate bonds, mortgage debt and credit-card debt.

- The SPV receives cash from its investors for its CDO sales and hence provides the original financial institution with cash for its assets.

- The CDOs subsequently provide interest payments for their holders as long as the income received from the underlying assets is sufficient to do so.
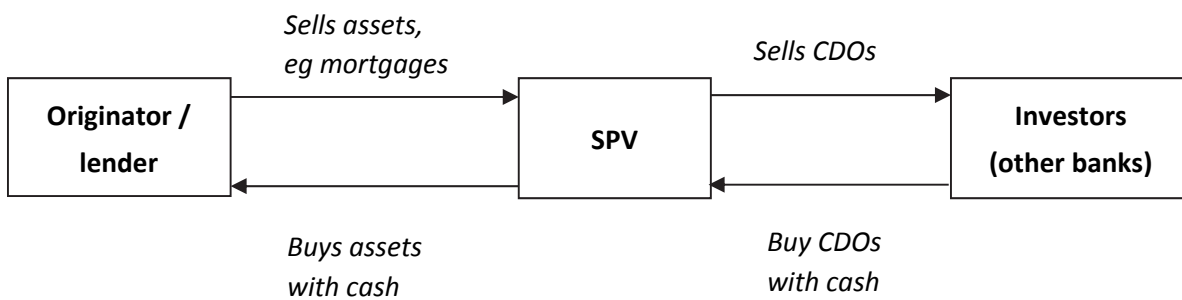
Question

Classify the following items into assets and liabilities of the commercial banks:

(a)	sight deposits
(b)	government bonds
(c)	repos
(d)	Treasury bills
(e)	overdrafts
(f)	market loans
(g)	bills of exchange
(h)	time deposits
(i)	reverse repos
(j)	advances to customers
(k)	mortgages
(l)	capital

(i)	assets
(ii)	liabilities

Solution

(i)	***assets***
(b)	government bonds
(d)	Treasury bills
(e)	overdrafts
(f)	market loans
(g)	bills of exchange
(i)	reverse repos
(j)	advances to customers
(k)	mortgages
(ii)	***liabilities***
(a)	sight deposits
(c)	repos
(h)	time deposits
(l)	capital

Certificates of deposit (CDs) are a liability of the bank that issues them and an asset of the bank that holds them.

Question

Fill in the gaps using the following terms:

collateralised debt obligations (CDOs)	*special purpose vehicle (SPV)*
liquidity	*sub-prime debt*
maturity gap	*gearing*
profitability	*co-ordination failure*
secondary marketing	*liabilities*
securitisation	

Over the years prior to the 'credit crunch' there was a huge expansion in bank _____ as a result of deregulation and financial innovation. There was also an increase in _____ as banks raised capital by increasing debt rather than equity. This increase in funds allowed an explosion of credit, but banks attempted to increase _____ by decreasing _____ and hence increasing the _____.

One way of reconciling the banks' two conflicting aims was the use of _____ of assets, *ie* the sale of assets before maturity to another institution. The main method for the sale of assets was through the process of _____. This process involved bundling up assets, such as mortgages, and selling them to an intermediary that the bank set up, known as a _____. This intermediary financed the purchase of these assets by the sale of bonds to other financial institutions. These bonds were known as _____.

This process of pooling assets encouraged banks to take greater risks, and many banks reduced their lending criteria, *eg* by granting mortgages to lower-income households and increasing income multiples. These loans were all bundled and re-sold. When there was an increase in the number of defaults on _____, banks that had bought re-packaged debt began to be concerned about their exposure to it. Banks became reluctant to lend and the 'credit crunch' was born.

This situation arose because of _____. Each bank acted independently without foreseeing the consequences for the economy as a whole.

Solution

Over the years prior to the 'credit crunch' there was a huge expansion in bank *liabilities* as a result of deregulation and financial innovation. There was also an increase in *gearing* as banks raised capital by increasing debt rather than equity. This increase in funds allowed an explosion of credit, but banks attempted to increase *profitability* by decreasing *liquidity* and hence increasing the *maturity gap*.

One way of reconciling the banks' two conflicting aims was the use of *secondary marketing* of assets, *ie* the sale of assets before maturity to another institution. The main method for the sale of assets was through the process of *securitisation*. This process involved bundling up assets, such as mortgages, and selling them to an intermediary that the bank set up, known as a *special purpose vehicle (SPV)*. This intermediary financed the purchase of these assets by the sale of bonds to other financial institutions. These bonds were known as *collateralised debt obligations (CDOs)*.

This process of pooling assets encouraged banks to take greater risks, and many banks reduced their lending criteria, *eg* by granting mortgages to lower-income households and increasing income multiples. These loans were all bundled and re-sold. When there was an increase in the number of defaults on *sub-prime debt*, banks that had bought re-packaged debt began to be concerned about their exposure to it. Banks became reluctant to lend and the 'credit crunch' was born.

This situation arose because of *co-ordination failure*. Each bank acted independently without foreseeing the consequences for the economy as a whole.

3 The history and consequences of banking crises

This section looks at the causes of banking crises, the responses of policymakers when they occur and also one or two wider issues relating to them. This material is entirely new to Subject CB2.

3.1 History and consequences of banking crises

Asset bubbles

The banking crisis of 2008, though it had many novel features, was in fact a classic financial panic following an asset bubble.

An asset bubble is a period during which asset prices increase rapidly over a short period of time, normally due to speculation. Such bubbles typically 'burst' leading to a subsequent dramatic fall in asset prices.

The first major financial bubble was *tulipmania*. In the 17th century, tulip flowers were brought into Holland from Turkey. When the demand for this unusual flower began to increase significantly, investors and speculators kept bidding to buy tulips and pushed prices up so that at the peak of the market, tulips were more expensive than gold. However, the bubble 'burst' when a buyer failed to collect his purchase and fear spread through the market that others may do the same. So confidence in the market was lost and prices collapsed in a matter of days.

More recent examples are the Wall Street crash of the 1920s, Japanese land in the 1980s and the technology or dot com bubble in 2000.

The nature of banking crises

Banking crises occur when a large number of banks fail or come very close to failure.

The interconnected nature of the modern banking system means that this can result in a failure of the financial system as a whole.

These crises are caused by an asset bubble where banks lend to those investing in an asset with a rapidly rising price, expecting the price rise to continue.

When the price of the asset reaches an unrealistic level and buyers are no longer prepared to purchase the asset, the bubble bursts. Falling asset prices lead to losses for the investors and undermine confidence in the banks that lent to them.

In the case of the 2008 financial crisis, it was mortgage lending in the USA, to households who were always likely to find it difficult to meet the mortgage payments and subsequently defaulted on their loans, which triggered the crisis.

A run on one bank would cause the depositors and lenders to lose confidence in the safety of their money with other banks and result in widespread bank failure.

One other reason for the spread of the problem to other banks, known as *financial market contagion*, is that as banks try to sell assets quickly to repay the depositors/investors, the forced sales reduce the price of these assets.

Since other banks and financial institutions hold similar assets, the falling prices also force these banks to sell assets at reduced prices causing even more banks to run into serious difficulty and leading to severe disruption of the financial system.

The response to banking crises

Countries can respond well to crises if they are better prepared in terms of sound economic conditions and healthy government finances. These will allow traditional economic policy tools to offset the effect of external shocks.

For example, if the government budget deficit is small, or the government finances are actually in surplus, this provides scope for increased government spending and/or tax cuts so as to boost spending and avoid a recession. Likewise, if inflation is moderate, then interest rates can be reduced in an attempt to encourage spending by firms and households.

A policy to expand the economy would lead to problems with the balance of payments, placing downward pressure on the exchange rate, potentially depleting foreign currency reserves. So, a government's ability to adopt a policy to stimulate the economy is limited if the foreign reserves are low. This may be problematic if the government is pursuing an exchange rate target.

In other words, domestic policy may conflict with exchange rate policy. This is discussed in detail in Module 21.

In the recent financial crisis there were some countries such as those in the emerging markets that were well prepared. Others, such as some countries in Eastern Europe, were not in as strong an economic position.

3.2   The recent crisis and rationality

Economics is the study of human behaviour and assumes humans make decisions rationally and not based on emotions.

Classic economic theory is based on the idea that individuals are rational. For example, consumers buying goods and services are assumed to maximise utility and investors faced with uncertainty are assumed to maximise expected utility. However, there is an increasing body of empirical evidence suggesting that in practice emotional and psychological factors often influence economic decisions.

Since the crisis of 2008, psycho-analysts have begun to take more note of the behaviour of the participants in the stock market and have discovered human emotions have a critical impact on financial markets.

For example, there is evidence that *group*, or *herd*, *behaviour*, whereby investors copy the behaviour of other investors (whether rational or not) contributes to stock market cycles.

The classic economic theory focuses on explaining the way that economic agents behave but it does not concern itself with whether the result is good or bad, moral or ethical. The crisis has generated discussion by focusing attention on ethical issues. For example, the rescue of the major banks by governments has caused the debate about moral hazard and private gain/public loss.

Background reference, for information only:

The Global Financial Crisis: Lessons Learned and Challenges for Developing Countries.
**Edwin M. Truman, Peterson Institute for International Economics, Remarks at the Eighteenth
Cycle of Economics Lectures, Banco de Guatemala, June 16, 2009.**

3.3   Checklist

Task	√*when completed*
Ensure that you can:	
• explain what is meant by an asset bubble	☐
• explain how banking crises can arise	☐
• define financial market contagion	☐
• outline the factors affecting a country's ability to respond to a banking crisis	☐
• outline the failings of classic economic theory.	☐

3.4   Questions

Question

Describe the moral hazard issue that arises if, in the event of a financial crisis, the government rescues financially distressed banks.

Solution

Suppose there is a financial crisis and the government rescues financially distressed banks. This will lead the banks to believe that in the event of future financial difficulties, they are again likely to be rescued by the government. Believing this to be the case may encourage the banks to undertake more of the risky lending activities (*eg* to sub-prime borrowers), so increasing the possibility of financial difficulties in the first place. This is because if all goes well and few sub-prime borrowers default on their loans, then the banks are likely to make large profits, whereas if many borrowers default and the banks incur substantial losses, then the government will bail them out and effectively share the losses.

4   The meaning and functions of money

4.1   What's included in this section

- The meaning of money

- The functions of money

- What should count as money?

4.2   Guidance

This section defines money in terms of its key function, which is as a *medium of exchange* that is used to buy goods and services, instead of exchanging goods and services themselves. However, deciding exactly what counts as money isn't entirely straightforward. Consequently, later on in this module, we go on to discuss other definitions of money that are used in practice.

4.3   Reading

Task	√*when completed*
Read Chapter 18, pages 552–553.	☐

4.4   Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key term: – medium of exchange	☐
• describe the four main functions of money	☐
• explain what is meant by money and discuss what might be included in the definition of money.	☐

4.5   Questions

Question

Which of the following are functions of money?

I   a means of measuring future payments
II   a unit of account
III   a means of saving

A   I and II
B   I and III
C   II and III
D   I, II and III

Solution

Option D. All three of the above are functions of money.

Remember that:

- a *unit of account* means a way of measuring the value of goods, services and assets

- the fourth and main function of money is as a *medium of exchange*.

Question

Which of the following statements is NOT true?

A   Money can be used to compare the values of shares and bonds.

B   Only notes and coins are included in the definition of money.

C   A medium of exchange is anything that is widely acceptable in exchange for goods and services.

D   In the absence of money, people will barter goods and services.

Solution

Option B. There are many different definitions of money. The broader definitions of money include not just notes and coins but also various types of bank accounts and other financial assets.

5 The supply of money

5.1 What's included in this section

- Definitions of the money supply

- The creation of credit: the simplest case

- The creation of credit: the real world

- What causes the money supply to rise?

- The flow-of-funds equation

5.2 Guidance

This section starts by considering the main definitions of money and how they are related via the credit creation process. It is important to understand both the concepts and the calculations underlying this process and to be familiar with:

- the *bank deposits multiplier*, which encapsulates the theoretical relationship between the monetary base and broad money

- the *money multiplier,* which allows for the real-world complications affecting the credit creation process and has a smaller value than the bank deposits multiplier.

Box 18.5 contains a helpful derivation of the money multiplier.

This section also considers the key factors that influence the money supply in practice and which cause it to grow over time. These factors are summarised in the *flow-of-funds equation* and an understanding of them is important if the central bank wishes to control the money supply as part of its monetary policy.

5.3 Reading

Task	√*when completed*
Read Chapter 18, pages 572–578 (up to and including the subsection on the flow-of-funds equation).	☐

5.4 Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– monetary base	☐
– broad money	☐
– bank deposits multiplier	☐
– near money	☐
– non-bank private sector	☐
– money multiplier	☐
– public sector net cash requirement (PSNCR)	☐
– flow-of-funds equation	☐
• explain the credit creation process in theory	☐
• calculate:	
– the bank deposits multiplier	☐
– the money multiplier	☐
• explain the three complications affecting the credit creation process in practice	☐
• explain the five main causes of changes in the money supply	☐
• state the flow-of-funds equation and discuss how its components influence the money supply.	☐

5.5 Questions

Question

The monetary base is £300 billion and the broad money supply is £1,500 billion. Assuming that the money multiplier and the bank deposits multiplier are equal in value, what is the liquidity ratio of the banking system?

A   5
B   0.5
C   0.33
D   0.2

Solution

Option D. The money multiplier m shows the relationship between the monetary base and the (broad) money supply and can be found as follows:

$$m = \frac{\text{M4}}{\text{monetary base}} = \frac{1500}{300} = 5$$

Assuming the money multiplier and the bank deposits multiplier (b) are equal in value we have:

$$m = b = \frac{1}{L} = 5$$

where L is the banks' liquidity ratio.

Hence $L = 0.2$.

Question

In each of the following cases, explain whether the money supply is likely to increase, decrease or be unaffected:

(a)   an increase in the public sector deficit financed by borrowing from the non-bank private sector

(b)   a decrease in the non-bank private sector's holdings of cash

(c)   an increase in the commercial banks' liquidity ratios

(d)   the sale of exports paid for in the domestic currency.

Solution

The money supply will:

(a)   be *unaffected* because the public's cash is withdrawn from banks and the government spends it, so it is redeposited in the banking system. Hence there is no overall change in the amount of cash held in the banking system.

(b)   *increase* because there will be more cash deposited in banks, rather than being held outside of the banking system, which they can use to create credit

(c)   *decrease* because banks hold more in cash and liquid assets, so less can be lent to customers

(d)   *increase* because the domestic currency will be deposited in banks and credit can be created on the basis of it.

Question

Show how an injection of £100 of cash into the banking sector can greatly increase the money supply. Assume banks wish to maintain a reserve ratio of 15%.

Solution

Suppose the banking sector has just received an extra £100 cash from a depositor. There is an increase of £100 in the bank's balance sheet. There are extra assets of £100 (the cash) and extra liabilities of £100 (*ie* the liability to pay the depositor £100 if he wants his money back). So, the change in the balance sheet of the banking system is as follows:

Assets		**Liabilities**	
Cash	£100	**Deposits**	£100

Let us suppose that the bank wishes to maintain a reserve (or liquidity) ratio of 15%. It will now be prepared to lend up to £85.

Once the borrowers have actually withdrawn the £85 cash/written a cheque for £85 the bank's balance sheet is as follows:

Assets		**Liabilities**	
Cash	£15	**Deposits**	£100
Loans	£85		

What happens next depends on what we assume.

Let's assume that all of the cash used by the borrowers is spent and finds its way back into the banking system, in the form of new deposits. Then, the change in the balance sheet for the whole banking sector will appear as follows:

Assets		**Liabilities**	
Cash	£100	**Deposits**	£185
Loans	£85		

(Cash and deposits have both increased by £85.)

These extra deposits are used to set up further overdraft facilities. 85% of the extra £85 (£72.25) will be used. Thus, once the overdraft facilities have been used the banks' balance sheet will appear as follows:

Assets		**Liabilities**	
Cash	£27.75	**Deposits**	£185
Loans	£157.25		

The new loans will again be spent and so find their way into the banking system and 85% of the extra £72.25 will then be used to finance further lending.

Thus, we have an increase in the money supply of:

$$£100 \times (1 + (0.85) + (0.85)^2 + (0.85)^3 + ...)$$

So, the total increase in the money supply would, in this case, ultimately be:

$$100 \times \frac{1}{1-(0.85)} = 666.67$$

Recall that the bank deposits multiplier is given by:

$$b = \frac{1}{L}$$

where L is the banks' liquidity ratio.

In this case, L = 0.15 , so the bank deposits multiplier is equal to:

$$b = \frac{1}{L} = \frac{1}{0.15} = 6.67$$

So, an injection of £100 into the banking sector increases the money supply by a multiple of 6.67 times this, ie £666.67.

Note that if we had made different assumptions, for example, that some of the cash held by borrowers wasn't redeposited into the banking system, then the money multiplier would be smaller and the money supply wouldn't expand by as much.

The practice questions start on the next page so that you can
keep the practice questions and solutions together for revision purposes.

Module 14 Practice Questions

14.1 A bank's decision to reduce loans and advances to customers and increase its reserve balances at the central bank whilst holdings of other liquid assets are held constant will:

A   increase the liquidity ratio and increase the maturity gap.

B   increase the liquidity ratio and decrease the maturity gap.

C   decrease the liquidity ratio and increase the maturity gap.

D   decrease the liquidity ratio and decrease the maturity gap.   [1½]

14.2 Which of the following is NOT a tool that the Bank of England uses to provide liquidity insurance for the banking system?

A   discount window facilities

B   quantitative easing

C   contingent term repo facilities

D   index long-term repos   [1½]

14.3 Which of the following ratios is the ratio of a company's borrowed capital to shares?

A   capital adequacy

B   gearing

C   liquidity

D   net stable funding   [1½]

14.4 Suppose that a 10,000 increase in monetary base results in a 40,000 increase in M4. If the public hold all their money in bank accounts, then the banks' reserve ratio is equal to:

A   0.10

B   0.175

C   0.20

D   0.25   [1½]

14.5 Outline the role of financial instruments, financial markets and financial institutions in a financial system.   [3]

14.6 (i)   List the main functions of the central bank.   [3]

(ii)   Explain the two main ways in which the Bank of England, in its role as lender of last resort, uses the money markets to provide liquidity to the banking system and exercises control over interest rates.   [4]

     [Total 7]

14.7 Describe the measures that have been (or are in the process of being) introduced to try to reduce the likelihood and the impact of a future financial crisis.   [6]

14.8 Discuss the effects of securitisation on the banking system.   [6]

14.9 Define the bank deposits multiplier and the money multiplier and explain why the latter typically has a smaller value than the former. [4]

Exam style

Module 14 Solutions

14.1   Option B. A reduction in loans and advances to customers and an increase in the reserve balances at the central bank will increase the bank's holdings of liquid assets and will *increase* the liquidity ratio (liquid assets/total assets).

The average maturity of the bank's loans will decrease, since it will have a smaller proportion of long-term loans (to customers), so the *maturity gap* (the difference in the average maturity of loans and deposits) will *decrease*.   [1½]

14.2   Option B. As lender of last resort, the Bank of England uses a variety of methods (such as Options A, C and D) to try to ensure that individual banks and the banking system as a whole has sufficient liquidity to meet customers' demand. Quantitative easing aims to increase the money supply.

[1½]

14.3   Option B. This is the definition of gearing from Section 2.

Note that the *capital adequacy ratio* is the ratio of a bank's capital (reserves and shares) to its risk-weighted assets, the *liquidity ratio* is the proportion of a bank's total assets held in liquid form, and the *net stable funding ratio* is the ratio of stable liabilities to assets likely to require funding (*ie* assets where there is a likelihood of default.   [1½]

14.4   Option D. The value of the money multiplier, *m*, is:

$$\frac{\Delta \text{ total money supply}}{\Delta \text{ monetary base}} = 4$$

However, *m* can also be calculated in terms of the *banks' reserve ratio*, *r*, as:

$$m = \frac{1+c}{r+c}$$

Since the public hold all their money in banks, *ie* $c = 0$, this is equal to:

$$m = \frac{1}{r}$$

So:

$$r = \frac{1}{m} = \frac{1}{4} = 0.25$$ [1½]

14.5   *Financial instruments* such as shares, bonds and mortgages transfer resources from savers to investors.   [1]

Financial markets, where instruments are traded, determine the price of the securities and enable allocation of capital.   [1]

Financial institutions offer a wide range of financial products and services and act as financial intermediaries.   [1]
                                                                                            [Total 3]

14.6   (i)   ***The functions of the central bank***

The central bank has the following functions:

1.   it issues notes

2.   it acts as banker to the government

3.   it acts as banker to the banks

4.   it acts as banker to overseas central banks

5.   it operates the government's monetary policy

6.   it provides liquidity to the banks

6.   it oversees (*ie* regulates) the activities of banks and other financial institutions

7.   it operates the government's exchange rate policy.   [½ each, maximum 3]

(ii)   ***The Bank of England and the money markets***

In its role as lender of last resort, the Bank of England can help to provide cash to the banking system in two main ways:

1.   sale and repurchase (repo) arrangements

2.   rediscounting.

Under repo arrangements, the Bank of England buys government securities (gilts) from the banks with cash, with an agreement to sell them back to the banks at a fixed price at a fixed date in the future.   [1]

The repurchase price (and hence the 'repo rate') is determined by the Bank of England to reflect the desired interest rate set by the Monetary Policy Committee (MPC).   [1]

Rediscounting occurs when the Bank of England buys back Treasury bills from the banks before maturity (and therefore at a price below the face value).   [1]

The price (and therefore the 'rediscount rate') is set by the Bank of England to reflect the MPC's desired interest rate.   [1]
                                                                                            [Total 4]

14.7   A number of *measures* have been (or are in the process of being) introduced:

- The *bank levy* on banks' liabilities aims to raise sufficient revenue to cover the fiscal costs of any future support and also to encourage banks to engage in less risky lending.   [1]

- *Enhanced capital requirements*, through the capital adequacy ratio (CAR), aim to ensure that each bank has sufficient capital to cover its particular risk portfolio of assets.   [1]

- *Macro-prudential regulation* involves assessing the stability of the financial system as a whole in the light of economic conditions ...   [1]

- ... and, if necessary, a *counter-cyclical buffer* (an increase in the CAR) can be applied to all banks in order to build up a capital buffer in boom times to draw on in times of recession or financial difficulty.   [1]

- Additional capital adequacy requirements have been introduced for *global systematically important banks (G-SIBs) / domestic systematically important banks (D-SIBs)*, whose failure could have wide-ranging affects upon the global / domestic financial system.   [1]

- A *non-risk-based leverage* ratio has been introduced. This requires financial institutions to operate with a Tier 1 capital-to-asset ratio of 3%, though the assets here are not risk-weighted.   [1]

- A *liquidity coverage ratio* was introduced, requiring financial institutions to have high quality liquid assets to cover the expected net cashflow over the next 30 days.   [1]

- A minimum *net stable funding ratio* is to be introduced. This is the ratio of stable liabilities to assets likely to require funding and is to be set at a minimum of 100% for banks.   [1]

[Maximum 6]

14.8   Securitisation enables banks to manage their exposure to default risk (by selling on risky assets)...[½]

.. and also to reduce liquidity risk (by selling illiquid assets for cash).   [1]

This may enable them to operate on a lower liquidity ratio and an increased maturity gap, so increasing profitability.   [1]

Securitisation also enables banks to grow. By allowing the sale of assets for cash, it provides banks with liquidity and enables them to engage in further lending, so increasing profitability.   [1]

In addition, by allowing the pooling of assets, securitisation reduces the cashflow risk for investors and therefore encourages financial investment.   [1]

However, by causing a lower average liquidity ratio throughout the banking system, securitisation might lead to an excessive expansion of credit.   [1]

Also, a *moral hazard* problem occurs, in that banks might be tempted to take greater risks in their lending, *eg* by making it easier for higher-risk borrowers to borrow, because the risks are being passed on to other financial institutions.   [1]

Of particular concern is the increased systemic risk of banking collapse because the fortunes of the banks become even more intertwined. Ultimately, many financial institutions may end up being exposed to the risk of the original bank's lending policy.   [1]

This form of market failure, called *co-ordination failure*, occurs when a group of firms, *eg* banks, act independently without foreseeing the consequences, when a more desirable outcome could have been achieved if they had co-ordinated their decision making.   [1]

[Maximum 6]

14.9   The *bank deposits multiplier* is defined as the number of times greater the expansion of deposits is than the additional liquidity that caused it.   [1]

The *money multiplier* is defined as the number of times greater the expansion of the money supply is than the expansion of the monetary base that caused it.   [1]

The money multiplier typically has a smaller value than the bank deposits multiplier because:

- Firms and households may hold cash outside of the banking system. Consequently, this cash isn't redeposited in the banking system and so cannot be used as a basis for further lending.   [1]

- Firms and households may wish to borrow less than banks wish to lend.   [1]

[Total 4]

15

The money market and monetary policy

Syllabus objectives

1.3   Analyse the recent macroeconomic history.

    3.   Describe the effectiveness of the monetary policy in the 2008 financial crisis and the governments' actions to combat recession.

3.7   Discuss the role of money and interest rates in the economy.

    4.   Describe how interest rates are determined.

    5.   Explain the relationship between money and interest rates.

3.10   Assess how macroeconomic policies impact on businesses.

    4.   Explain how monetary policy works in the UK and the Eurozone and describe the roles of the Bank of England and the European Central Bank.

Core Reading

Chapter 18 (Section 3, from the subsection on the relationship between money supply and the rate of interest onwards)   *Pages 578–580*

Chapter 18 (Sections 4 and 5)   *Pages 580–585*

Chapter 22 (Section 3)   *Pages 686–703*

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0   Introduction

This module looks further at the workings of the financial system, with particular reference to the role of money. It follows on directly from the discussion of the financial system in Module 14.

The first section covers the influence of interest rates on the supply of, and demand for, money and develops a simple model of how equilibrium in the money market determines the general level of short-term interest rates. In doing so it discusses the factors that influence the demand for money.

The second section then builds on this to discuss *monetary policy*, which involves the manipulation of the money supply and/or interest rates, typically by the central bank. Together with fiscal policy (which involves the manipulation of government spending and taxes), monetary policy is a key policy used to influence aggregate demand, *ie* total spending in the domestic economy. In practice, monetary policy has typically been used to try and control inflation, although it may also be used to try and meet other objectives, *eg* with regard to growth, employment and the exchange rate.

This material is not new to Subject CB2 and it has been a regular focus of exam questions.

1   The money market model

1.1   What's included in this section

- The relationship between the money supply and interest rates

- The motives for holding money

- The transactions plus precautionary demand for money

- The speculative (or assets) demand for money

- The total demand for money

- Equilibrium in the money market

- Equilibrium in the foreign exchange market

1.2   Guidance

This section describes a fairly simple, but insightful model of how the general level of short-term interest rates is determined in the money market – the market for short-term borrowing and lending. Here it is helpful to think in terms of broad money, *ie* cash and deposits, rather than the monetary base (as described in Module 14). It is important to know and understand the various factors that influence the relationship between interest rates and the supply of, and demand for, money.

We can then draw a money supply curve, which could be either vertical or upward-sloping, and a downward-sloping money demand curve. The intersection of the two curves determines the equilibrium level of interest rates. Any subsequent change in the factors influencing supply or demand will then lead to a shift in one (or both) of the curves, and hence a change in interest rates.

A change in interest rates also affects the exchange rate. This was discussed briefly in Module 13 and is covered in more detail here.

1.3   Reading

Task	*√when completed*
Read Chapter 18, pages 578–585 (starting with the subsection on the relationship between money supply and the rate of interest).	☐

1.4   Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– exogenous money supply	☐
– endogenous money supply	☐
– liquidity preference	☐
– active balances	☐
– idle balances	☐
• draw an:	
– exogenous money supply curve	☐
– endogenous money supply curve	☐
• explain why the money supply is typically assumed to slope upwards	☐
• describe the main motives for holding money	☐
• discuss the factors influencing the transactions and precautionary demands for money	☐
• discuss the factors influencing the speculative demand for money	☐
• discuss the additional effects of expectations on the total demand for money	☐
• draw the:	
– demand for active money curve	☐
– the demand for idle money curve	☐
– the total demand for money curve	☐
• draw a diagram of the money market showing the equilibrium interest rate and use it to help explain the effect on interest rates of:	
– a change in the supply of money	☐
– a change in the demand for money	☐
• explain the effect of a change in the money supply on the exchange rate.	☐

1.5   Questions

Question

The opportunity cost of holding money is the:

A   interest rate on shares and bonds.

B   interest rate on bank deposits.

C   inflation rate.

D   additional return foregone by not holding shares and bonds.

Solution

Option D. The main alternative to holding low-risk and low-return money is holding higher-risk and higher-return shares and bonds, so the opportunity cost of holding money is the interest rate foregone by not holding shares and bonds. For example, if the rate of interest on a bank account is ½% and that on the best alternative is 6%, the opportunity cost is 5½%.

Question

(i)   Describe the three motives for holding money balances.

(ii)   Draw the demand for money curve and describe the effect on the demand for money curve of:

      (a)   a rise in nominal national income

      (b)   a rise in interest rates

      (c)   a rise in the expected value of the domestic currency.

Solution

(i)   The *transactions motive* is the money that is held to buy everyday goods and services. The amount held depends primarily on nominal income (and therefore on real income and prices) and the frequency with which people get paid.

The *precautionary motive* is the money that consumers and firms hold to cover unexpected events, *eg* to take advantage of a bargain or to cope with an emergency.

Under both the transactions and precautionary motives, the demand for money may be influenced slightly by interest rates, which will affect the spend/save decision.

The *asset* or *speculative motive* is money that is held as a form of saving. Money has the advantages of being liquid and less risky than other forms of savings such as bonds and shares, but the disadvantage of earning a lower rate of return. Therefore, the amount held is inversely related to the rate of interest.

(ii)   The demand for money function shows the relationship between the demand for money and the interest rate. Given the above, it is therefore a downward-sloping curve.
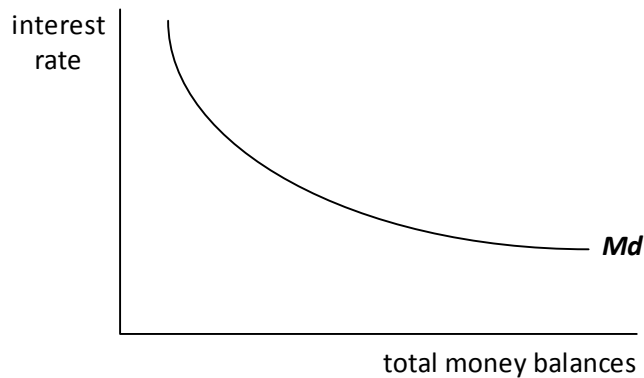
(ii)(a)   A rise in nominal income leads to an increase in the transactions demand for money. It will probably increase the precautionary demand too as people hold more money 'just in case'. The demand for money curve shifts to the right.

(ii)(b)   A rise in interest rates is typically associated with a greater rise in the expected return on risky assets such as shares. It therefore increases the opportunity cost of holding savings in the form of money rather than risky assets. There is a movement *along* the demand for money curve upwards to the left.

(iii)(c)   An increase in the expected value of the domestic currency will cause an increase in the demand for the currency, *ie* the demand for money curve will shift to the right.

Question

Distinguish between an exogenous money supply and an endogenous money supply.

Solution

An *exogenous money supply* is one that does not depend on interest rates. Instead it is assumed to be determined solely by the authorities (the government or the central bank). The money supply curve is therefore vertical.

An *endogenous money supply* is one that depends (in part) on interest rates. This will be the case if an increase in interest rates encourages banks to lend more (because the interest rate margin between what they pay depositors and what they charge borrowers is greater when the interest rates are higher). It corresponds to a money supply curve that slopes upwards.

---

2   Monetary policy

2.1   What's included in this section

- The policy setting

- Control of monetary policy over the medium and long term

- The operation of monetary policy in the short term

- Techniques to control the money supply

- Difficulties in controlling the money supply

- Techniques to control interest rates

- Problems with controlling interest rates

- Using monetary policy

2.2   Guidance

This quite lengthy section discusses monetary policy, which is one of the two main macroeconomic policies used to manage the domestic economy – the other is fiscal policy. It contains much detailed information and so it is important to study it thoroughly.

Monetary policy is concerned with controlling the money supply and/or the level of short-term interest rates in order to influence aggregate demand. It is therefore referred to as a *demand-side policy*.

For each of the money supply and interest rates, it is essential to understand both the means by which it can be controlled and the practical difficulties encountered. The boxes in the textbook provide some interesting background information on these issues, including the roles of, and actions taken by, the Bank of England and the European Central Bank. In particular, Box 22.10 discusses the use of *quantitative easing*, which has been a key policy used in response to the financial crisis of 2008. A key consequence of the practical difficulties is that the effects of implementing monetary policy are unpredictable.

Finally, bear in mind that the link between the money supply and the level of interest rates can be illustrated using the money market equilibrium model discussed in the previous section.

2.3   Reading

Task	*√when completed*
Read Chapter 22, pages 686–703.	☐

2.4 Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– minimum reserve ratio	☐
– long-run neutrality of money	☐
– open market operations	☐
– funding (in monetary policy)	☐
– monetary base control	☐
– disintermediation	☐
– sterilisation	☐
– Goodhart's Law	☐
– quantitative easing	☐
• outline the three possible approaches to the role of the central bank in monetary policy and give an example of each	☐
• explain the two key influences on monetary growth over the medium and long term	☐
• outline the link between long-term monetary control and inflation	☐
• describe the possible ways of operating monetary policy in the short term, with the use of the money market diagram	☐
• outline the two broad approaches to controlling the money supply	☐
• explain the four techniques that can be used to control the money supply	☐
• explain why it may be difficult to control:	
– the monetary base	☐
– the broad money supply	☐
• explain how the central bank can control interest rates	☐
• discuss the problems of using interest rates to control credit	☐
• discuss the effectiveness of monetary policy in influencing the level of aggregate demand	☐
• describe the responses of the Bank of England and the European Central Bank to the financial crisis of 2008.	☐

2.5   Questions

Question

Which of the following approaches would NOT be used by a central bank that wishes to avoid increasing the money supply?

A   selling government bonds to banks
B   reducing its willingness to lend to banks
C   funding government borrowing by selling Treasury bills instead of government bonds
D   raising the reserve ratio banks are required to hold

Solution

Option C. Funding government borrowing by selling Treasury bills will increase the banks' holdings of liquid assets, so increasing their willingness and ability to lend. The money supply will therefore increase.

This contrasts with funding the borrowing by selling government bonds, which will likely have no overall effect on the money supply. This is because the government spends the money borrowed on goods and services, which is then redeposited back in the banks, and so there is no overall change in banks' holdings of cash and hence in their ability to create credit.

Options A, B and D will all lead to a contraction in the money supply.

Question

Government attempts to increase the monetary base are likely to cause short-term interest rates to:

A   rise and reduce the quantity of money demanded.
B   rise and raise the quantity of money demanded.
C   fall and reduce the quantity of money demanded.
D   fall and raise the quantity of money demanded.

Solution

Option D. Increasing the monetary base will initially lead to an excess of money supply over money demand leading to a fall in short-term interest rates. As money demand depends negatively upon interest rates, this fall in interest rates will also lead to an increase in the quantity of money demanded, *ie* a movement along the demand for money curve.

This corresponds to a rightward shift of the money supply curve on the money market equilibrium diagram.

Question

The central bank in Country X is considering implementing an increase in interest rates as part of a contractionary monetary policy aimed at reducing inflation. However, it is concerned that the demand for loans may be highly inelastic and so a large increase in interest rates will be required.

Describe the problems that would be encountered if its concerns prove to be correct.

Solution

A large rise in interest rates may lead to the following problems:

- a fall in investment by firms, resulting in lower long-term growth

- an increase in inflation in the short run, as borrowing costs increase for firms and households

- higher household borrowing costs (*eg* on mortgages and overdrafts), which will prove politically unpopular

- the need to sell large volumes of government bonds in order to constrain the money supply, on which the government may have to pay high interest rates for years to come

- an inflow of money from abroad, making it difficult to restrain bank lending and driving up the exchange rate, making exports less competitive and resulting in a worsening of the current account position.

Question

Define quantitative easing and explain how and why it was used by the Bank of England in response to the financial crisis of 2008.

Solution

Quantitative easing (QE) is an extreme from of open market operations, by which the central bank aims to deliberately increase the money supply by buying large amounts of securities, primarily government bonds, from banks.

The hope was that the banks would use the extra cash to increase lending to firms and households, who would borrow in order to increase their spending. Consequently, aggregate demand would increase and a recession will be avoided, or at least its extent would be reduced.

QE was adopted by the Bank of England only after it had cut its base rate to ½% in 2009 in order to stimulate demand. This was because despite the historically low cost of borrowing, a lack of confidence meant firms and households were unwilling to borrow and spend and it wasn't possible to cut base rate much further.

Between 2009 and 2012, the Bank of England used QE to purchase £375 billion of assets.

Module 15 Practice Questions

15.1 Which of the following statements is NOT true?

Exam style

A   The increase in the use of credit cards leads to a decrease in the demand for active money balances.

B   A switch from predominantly weekly to monthly wage payments leads to an increase in the demand for active money balances.

C   An expectation that the domestic currency is likely to depreciate leads to a decrease in the demand for idle money balances.

D   An expectation that share prices will rise leads to an increase in the demand for idle money balances.   [1½]

15.2 Consider an economy where the demand for money balances is interest-elastic and the demand for investment is interest-inelastic. A change in the money supply will result in a relatively:

Exam style

A   small change in the rate of interest and the level of investment.

B   large change in the rate of interest and the level of investment.

C   small change in the rate of interest and a relatively large change in the level of investment.

D   large change in the rate of interest and a relatively small change in the level of investment.   [1½]

15.3 (i)   Draw a diagram to illustrate equilibrium in the money market.   [1]

Exam style

(ii)   Explain, with the aid of a diagram, the effect on the general level of interest rates of:

(a)   an increase in the money supply

(b)   an increase in nominal national income.   [4]
                                                                                   [Total 5]

15.4 Outline, with reference to the roles of the Bank of England and the European Central Bank, the three different ways in which monetary policy can be implemented in practice.   [4]

Exam style
Exam style

15.5 Explain how the monetary authorities of a country can use the following techniques to expand or contract the money supply:

Exam style

(i)   open market operations   [3]

(ii)   funding   [3]

(iii)   minimum reserve requirements.   [2]
                                                                                   [Total 8]

15.6 Explain why it is difficult in practice for the central bank to contract the money supply by controlling the monetary base, *ie* the notes and coins in circulation outside of the central bank.   [6]

Exam style

15.7 (i) Explain how monetary policy could be used to expand economic activity in the short
run. [5]

(ii) Discuss the potential problems that may undermine the effectiveness of such a policy. [5]
[Total 10]

ABC # Module 15 Solutions

15.1   Option D. If investors expect share prices to rise, they will switch some of their investments from cash to shares. So, their holdings of money balances as an asset will *decrease*.

Recall that *active* money balances refers to money held for *transactions* and *precautionary* purposes, whereas *idle* money balances refers to money held as an *asset* and/or for *speculative* purposes.   [1½]

15.2   Option A. To see this, consider an increase in the money supply. This will reduce interest rates so that the supply and demand for money can be brought back into equilibrium. The fact that the *demand* for money is interest-elastic, *ie* the money demand curve is relatively flat, means that this can happen with only a *small* reduction in interest rates. Almost by definition, if investment is interest-inelastic it would not be increased much even by a large reduction in interest rates. The correct answer is therefore Option A.   [1½]

15.3   (i)   *Equilibrium in the money market*
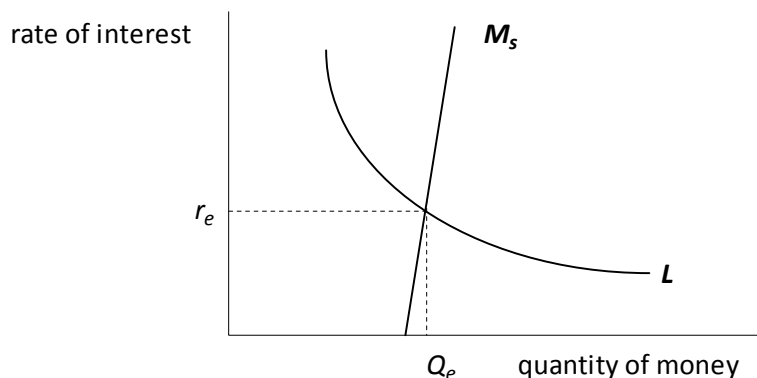
[1]

(ii)(a)   *Increase in the money supply*

An increase in the money supply (*eg* resulting from the central bank buying bonds) will lead to an excess supply of money at the original interest rate r_1. To encourage people to demand more money, *eg* with which to buy goods and services or even risky assets, banks will reduce interest rates.   [1]
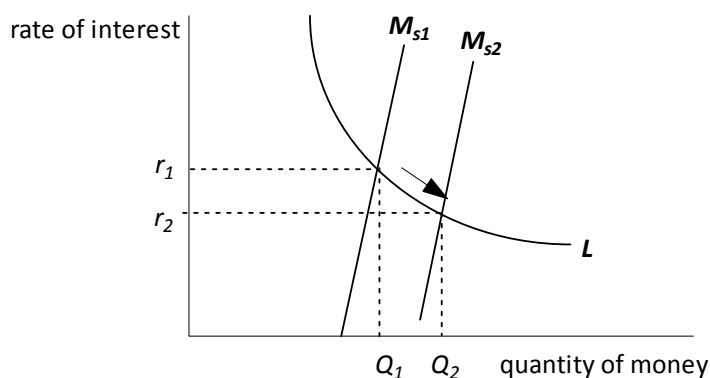
[1]

(ii)(b)   *Increase in money national income*

An increase in nominal national income (whether caused by an increase in real income or an increase in the price level) will lead to an increase in the demand for money, *eg* as people will want to hold money with which to buy goods and services. This will result in an excess demand for money at the original interest rate r_1. To encourage a greater supply of money (and to reduce the demand for idle money), interest rates will rise.   [1]
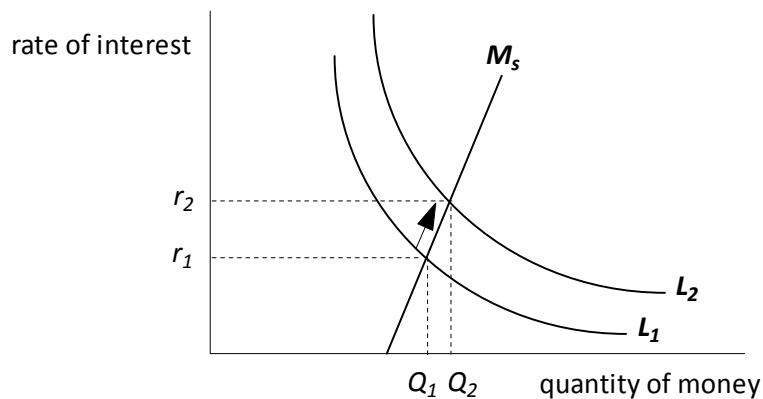
[1]

15.4   Monetary policy can be implemented in the following ways:

- The government sets the inflation target and the required interest rate, while the central bank influences the money markets to achieve this rate.   [1]

- The government sets the inflation target, but the central bank sets interest rates in order to achieve the inflation target.   [1]

    This is the approach used in the UK, where the *Bank of England* has complete freedom to set interest rates in order to attain the government's 2% *pa* ($\pm$1% *pa*) CPI inflation target.
                                                                                        [1]

- The central bank independently sets the target and carries out the necessary policy measures.   [1]

    This is essentially how the *European Central Bank (ECB)* operates within the Eurozone. [½]
                                                                                [Maximum 4]

15.5   (i)   *Using open market operations to control the money supply*

An *open market operation* occurs when the central bank sells (or buys) bonds to (from) the private sector, primarily banks, in order to influence the money supply.   [1]

Buying bonds will increase the monetary base since the private sector exchanges bonds for cash. Selling bonds will reduce the monetary base since the private sector exchanges cash for bonds. [1]

This controls the money supply since:

broad money supply = money multiplier $\times$ monetary base   [1]
                                                                                  [Total 3]

(ii)   *Using funding to control the money supply*

Funding is concerned with the *structure* of government debt, *ie* the mix of short-term liquid Treasury bills and long-term illiquid government bonds used to fund a given level of public sector borrowing.   [½]

If the central bank wants to *restrict* the supply of money, it will issue a higher proportion of (illiquid) government bonds and a lower proportion of (liquid) Treasury bills.   [1]

This is because selling government bonds to banks or the general public and then spending the money so raised will not affect banks' holdings of cash and liquid assets. Consequently, the money supply will be unaffected.   [1]

Conversely, if the central bank wishes to create credit, it will issue a higher proportion of Treasury bills. Since these form part of the liquid assets of the commercial banks, an increase in the availability of these increases the banks' ability to create credit.   [1]

[Maximum 3]

(iii)   *Using minimum reserve requirements to control the money supply*

A *minimum reserve ratio* is a minimum ratio of cash and liquid reserves to deposits, *ie* a minimum liquidity ratio, which the central bank requires commercial banks to hold.   [1]

Provided that the reserve ratio is greater than the liquidity ratio banks would choose if left to their own devices, then reserve requirements restrict the banks' ability to expand the money supply through lending. In other words, the value of the money multiplier is reduced.   [1]

[Total 2]

15.6   The central bank could attempt to contract the monetary base by imposing statutory minimum cash ratios, *ie reserving requirements*, in excess of the levels that banks would choose to hold themselves.   [1]

This means that if the central bank embarked on open market operations by selling bonds, cash reserves at banks would fall, causing banks to reduce loans and hence reduce broad money.   [1]

However, banks could choose to deliberately hold excess cash, so that they could respond to any restriction of cash by reducing their cash ratio, rather than reducing lending.   [1]

If the minimum cash ratio doesn't apply to all financial institutions, then some lending many shift to uncontrolled institutions, including those overseas, *ie disintermediation* may occur, and domestic banks may lend to domestic customers using foreign money markets, thus shifting business abroad.   [1]

Alternatively, if the banks subject to the cash ratios are short of cash, they could attract cash away from the uncontrolled financial institutions, or by offering higher interest rates to individual depositors, so as to expand their cash reserves.   [1]

In addition, monetary base control is difficult as the central bank is always prepared to provide cash to banks via repos and/or rediscounting if it is demanded.   [1]

The value of the money multiplier varies unpredictability, which means changes in the monetary base engineered by open market operations can have an unpredictable effect on the broad money supply.   [1]

This may be due to banks varying their desired liquidity ratio or operating on a liquidity ratio other than their desired rate.   [1]

The liquidity ratio might also vary with financial innovations, such as securitisation.   [½]

A change in the private sector's required ratio of cash to sight deposits will also cause the value of the money multiplier to change. For example, if the public hold more in cash outside of the banking system, the banks will have less in deposits and be able to create less credit.   [1]

[Maximum 6]

15.7   (i)   *The use of expansionary monetary policy*

Monetary policy is the use of the money supply and interest rates to influence the level of aggregate demand in the economy.   [½]

An increase in the money supply and a reduction in interest rates would reduce the cost of borrowing and hence stimulate consumer spending and investment.   [1]

The reduction in interest rates would also make the domestic economy a less attractive place for savings and so 'hot money' might leave the country, with a consequent reduction in the value of the domestic currency.   [1]

This would make exports more competitive and imports less competitive and would therefore increase the demand for net exports.   [1]

The increase in the money supply could be achieved by:

- *expansionary open market operations* involving the central bank purchasing government securities in exchange for cash, including …   [½]

  … *quantitative easing*, an aggressive form of open market operations, which involves the central bank purchasing large quantities of existing securities (private-sector debt and government debt) in exchange for cash   [½]

- changing the *funding* of the government's debt by issuing a higher proportion of liquid Treasury bills and a lower proportion of illiquid bonds to increase the liquidity of the banks
  [½]

- increasing the amount and reducing the rate at which it is prepared to *lend to banks* as lender of last resort to increase the banks' willingness to risk having to borrow from the central bank   [½]

- reducing any *minimum reserve requirements* that restrict the banks' ability to expand the money supply through lending   [½]

An additional method to increase the money supply could involve *removing or relaxing any controls or quotas on credit* – again making it easier and/or cheaper for consumers to borrow in order to fund additional consumption spending.   [½]

[Maximum 5]

(ii)   ***Potential problems***

The effectiveness of expansionary monetary policy may be undermined by:

- the difficulties in controlling the money supply, for example:

    –   there might be an increase in the banks' preferred liquidity ratio (perhaps a poor economic outlook makes the banks reluctant to lend and the public reluctant to borrow) and therefore a decrease in the value of the money multiplier   [1]

    –   there might be an increase in the public's preference for cash, which would decrease the value of the money multiplier   [½]

    –   there might be a decrease in the amount of liquid assets available, *eg* certificates of deposit, which would reduce the amount of credit that could be created   [½]

- weak links in the transmission mechanisms, for example:

    –   the demand for money might be very sensitive to changes in interest rates (*ie* interest-elastic), so that, when the money supply increases, only a small fall in interest rates is necessary to encourage people to sell their bonds and hold this extra money   [½]

    –   investment and consumption might be insensitive to changes in interest rates, so that any fall in interest rates produces only a modest increase in the level of economic activity   [½]

    –   the exchange rate may be insensitive to the reduction in interest rates (because it is affected by many other factors)   [½]

    –   net exports may be insensitive to the reduction in the exchange rate (*ie* the demand for exports and imports is insufficiently elastic).   [½]

If the domestic currency depreciates, then this would make imports more expensive, so reinforcing any cost-push inflationary pressures in the economy.   [½]

Time lags could cause the policies to be destabilising. By the time the policies take effect, the original recession might have turned into a boom – in which case, these policies would accentuate the boom and cause demand-pull inflation.   [1]

[Maximum 5]

End of Part 2

What next?

1.   Briefly **review** the key areas of Part 2

2.   Ensure you have attempted some of the **Practice Questions** at the end of each module in Part 2. If you don't have time to do them all, you could save the remainder for use as part of your revision.

3.   Attempt **Assignment X2**.

Time to consider …

… 'revision and rehearsal' and 'rehearsal' products

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16

Classical and Keynesian theory

Syllabus objectives

1.2   Assess the main strands of economic thinking.

3.5   Discuss the macroeconomic environment of the business.

   2.   Explain what determines the level of economic activity and hence the overall business climate.

   3.   Describe the effect on business output if a stimulus is given to the economy.

3.9   Discuss what determines the level of business activity and how it affects unemployment and inflation.

   1.   Discuss how the equilibrium level of income is determined within a simple aggregate demand-expenditure model.

   2.   Describe the concept of the multiplier and calculate its value.

   4.   Describe the relationship between unemployment and inflation and whether the relationship is stable.

   7.   Describe what determines the course of a business cycle and its turning points.

   8.   Discuss whether the business cycle is caused by changes in aggregate demand, or changes in aggregate supply (or both).

Core Reading

0   Introduction

In this module, we begin with a description of the development of modern macroeconomic theory. In doing so, we review some of the ideas and issues introduced in Module 2.

We start with classical theory, which developed in the 18th century and was still widely accepted in the 1930s.

John Maynard Keynes, who suggested new policies to reduce the mass unemployment of the time, said that practical business people and politicians would not listen to his ideas because they were slaves of 'defunct economists'. He therefore had to dismantle the old classical theory before he could get his own ideas accepted. This he did in his famous book, 'The general theory of employment, interest and money', published in 1936.

We study the simple Keynesian model of the economy in depth in this module, including his policy recommendations for achieving full employment and stable prices. Keynesian demand-management policies were pursued by many governments from 1945 to the mid-1970s when they came under increased criticism. Keynes himself died in 1946 so was unable to adapt his theory to the changing times. The work of his critics and his followers will be examined in the following modules.

At the end of this module, there is a section on the Keynesian views of the business cycle. Much of this work is based on the work of Keynes' followers (known as Keynesians) rather than Keynes himself.

In the course of this module, there is discussion about the shape of the aggregate supply (*AS*) curve in the short run and in the long run. This is an important discussion as the shape of the *AS* curve determines the effectiveness of demand-side policy.

The material on the classical theory and Keynes' criticisms of it is new to Subject CB2. Although Keynesian theory is not new, it is now studied in greater depth.

1 Classical theory

1.1 What's included in this section

- The classical analysis of output and employment

- The classical analysis of prices and inflation

- The classical response to the Great Depression

- The classical model of labour markets and aggregate supply

1.2 Guidance

As a guide to the reading, the following might be of help:

- We are studying classical theory in this section of the module, but Section 1 of Chapter 16 of the textbook provides an interesting and useful background to the development of macroeconomic theory and policy. We will study it fully in Module 23.

- Classical economic theory, encapsulated in Say's law, which stated that 'supply creates its own demand', predicted that the economy will operate at more-or-less full employment. The main role of government was therefore limited to ensuring price stability by controlling the money supply. It is important that we understand the reasons for these key beliefs, and also the reasons given by the classical economists for the high unemployment of the 1930s.

- Many of the debates that occurred between economists in the 1930s were repeated in the aftermath of the financial crisis of 2008.

- The quantity theory of money ($M\overline{V} = P\overline{Y}$) states that inflation (a rise in the price level, *P*) is caused by an increase in the money supply, *M*. This conclusion is reached because of the theory's assumptions that *V*, velocity of circulation, and *Y*, real national income, are independent of *M*. The theory, its assumptions and the mechanisms by which the money supply affects prices will be studied in further detail in Modules 17 and 18.

- The labour market model, which we met in Module 12, and the *AD-AS* model, which we met in Module 11, were not developed at the time of the classical economists, but they are used at the end of this section to explain the classical view of unemployment and the shape of the *AS* curve.

- This material is new to Subject CB2.

1.3   Reading

Task	√when completed
Re-read Module 2, Sections 1.4 and 1.5.	☐
Read Chapter 16, pages 492–498.	☐
Read Chapter 20, pages 637–638 (subsection on the classical model of labour markets and aggregate supply).	☐

1.4   Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– market for loanable funds	☐
– gold standard	☐
– Say's law	☐
– quantity theory of money	☐
– equation of exchange	☐
– velocity of circulation	☐
– neutrality of money	☐
– crowding out	☐
– money illusion	☐
– natural level of real income (or output)	☐
• explain why, according to classical theory:	
– savings equals investment	☐
– imports equals exports	☐
– taxation must equal government spending	☐
– there will be no deficiency of demand (and therefore no unemployment)	☐
– an increase in the money supply causes inflation	☐
• discuss some of the main causes of the Great Depression in the UK in the 1930s.	☐

Task	√*when completed*
Continued Ensure that you can: • discuss the classical view of the following policies to combat the depression:	
– encouraging wage cuts	☐
– encouraging saving	☐
– public works projects	☐
• use the labour market model to explain why classical economists believe that the labour market is always at equilibrium and that only natural unemployment will occur	☐
• use the *AD-AS* model to explain why classical economists believe that the long-run *AS* curve is vertical.	☐

1.5 Questions

Question

According to classical theory, withdrawals should equal injections because:

A   the equation of exchange says that prices will adjust so that savings will equal investment.

B   Say's law says that demand creates its own supply.

C   a flexible exchange rate ensures that exports equals imports.

D   none of the above.

Solution

Option D. Classical theory says that withdrawals should equal injections because:

• the rate of interest in the market for loanable funds will ensure that savings equals investment

• the gold standard mechanism ensures that exports equals imports

• the government should ensure that it balances its own budget, *ie* government spending equals taxation.

Question

In the quantity theory of money, which of the following is assumed?

A   Real output is assumed to be constant and the velocity of circulation of money is assumed to be falling.

B   Real output is assumed to be rising and the velocity of circulation of money is assumed to be constant.

C   Real output is assumed to be constant and the velocity of circulation of money is assumed to be constant.

D   Real output is assumed to be falling and the velocity of circulation of money is assumed to be rising.

Solution

Option C. In the quantity theory of money ($M\overline{V} = P\overline{Y}$), velocity of circulation (V) and real output (Y) are assumed to be fixed.

Question

Under the gold standard, a balance of payments deficit would lead to:

A   an outflow of gold, an increase in the money supply, an increase in prices, a decrease in imports and an increase in exports.

B   an outflow of gold, a decrease in the money supply, a decrease in prices, a decrease in imports and an increase in exports.

C   an inflow of gold, an increase in the money supply, an increase in prices, an increase in imports and a decrease in exports.

D   an inflow of gold, a decrease in the money supply, a decrease in prices, a decrease in imports and an increase in exports.

Solution

Option B. Under the gold standard, a country's deficit was paid in gold from its reserves, so a deficit would lead to an outflow of gold. The domestic money supply was backed by gold, so if the gold reserves fell, the money supply had to fall. According to the quantity theory, if the money supply fell, prices fell. This would make exports more competitive and imports less competitive, therefore the sale of exports would rise and the sales of imports would fall.

Question

State Say's law and explain its importance in the classical theory of employment.

Solution

Say's law states that 'supply creates its own demand'. This means that the process of producing the goods creates the income with which to buy them. As long as the economy starts from a position of full employment, there is no reason why it ought not stay that way.

The possibility of people withdrawing their income (in the form of savings, taxes and imports) rather than spending it was covered by other parts of classical theory. The loanable funds theory suggested that savings should equal investment, and the gold standard suggested that exports should equal imports. So if governments followed a balanced budget, taxation should equal government spending and hence total withdrawals would be compensated by total injections.

Therefore, Say's law, together with the assumption of withdrawals equalling injections, suggested that there would be no deficiency of demand and full employment would be ensured.

Question

Explain why a return to the gold standard at a relatively high pre-war rate in 1925 contributed to the Great Depression.

Solution

The higher the rate, the higher the price of exports abroad and therefore, the less competitive UK exports were. On the other hand, UK imports were relatively cheap and more attractive to buy. The balance of payments deficit increased, but the automatic deflationary mechanism of the gold standard failed to work. Rather than wages and prices falling (to restore competitiveness), output fell and unemployment rose.

Question

Explain why classical economists at the Treasury in the UK rejected calls for public works projects in the 1930s.

Solution

The Treasury insisted on maintaining a balanced budget. When tax receipts began to fall (as a result of lower income and profits) and unemployment benefits rose, the government cut spending elsewhere. Even though this policy wasn't working, (because less government spending led to higher unemployment) they kept to it. So, when Keynes and others advocated public works projects, such as new infrastructure, the Treasury were disposed to reject the proposal because there was no sensible way of financing it. They considered three options:

1.   If taxation increased, consumer spending and investment would fall, thus offsetting the extra government spending on public works.

2.   If government borrowing increased, higher interest rates would have to be offered on government bonds, and higher interest rates generally in the economy would reduce (or *crowd out*) private sector investment.

3.   If government borrowing from the central bank increased (a process known as printing money) this would lead to inflation (according to the quantity theory of money), which would further reduce international competitiveness.

Question

According to the classical view of the labour market, an increase in aggregate demand causes:

A   an increase in real wages in the long run.
B   a decrease in real wages in the short run.
C   no change in real wages in the short run.
D   a decrease in real wages in the long run.

Solution

Option B. Classical economists argue that an increase in aggregate demand will lead to an increase in the price level and hence a reduction in real wages in the short run. However, since at lower real wages, there is excess demand for labour, there will be an increase in nominal wages so that real wages return to the original equilibrium level in the long run.

Question

According to the classical view:

A   the short-run *AS* curve is vertical and the long-run *AS* curve is vertical.
B   the short-run *AS* curve slopes upwards and the long-run *AS* curve slopes upwards.
C   the short-run *AS* curve slopes upwards and the long-run *AS* curve is vertical.
D   the short-run *AS* curve is horizontal and the long-run *AS* curve is vertical.

Solution

Option C.
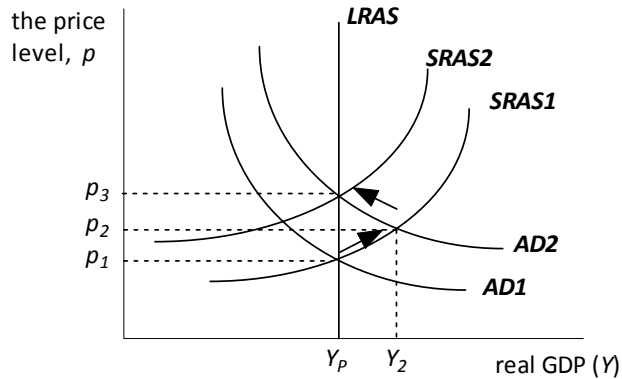
Classical economists argue that the economy will settle at a long-run equilibrium at its natural level (or potential) level of output, Y_P.

As the diagram above shows, an increase in aggregate demand will, in the short run, lead to an increase in the price level from p_1 to p_2 and an increase in output beyond its potential output from Y_P to Y_2.

However, over time, the increase in the price level will lead to an increase in nominal wages, which will increase firms' costs, so the *SRAS* curve shifts upwards to the left. This increases the price further to p_3 and reduces output back to its potential output Y_P. Therefore, although output increases in the short run in response to an increase in aggregate demand, in the long run output is fixed at Y_P.

As mentioned earlier, the AD-AS model is a recently developed model and therefore was not used by the classical economists. Notice that this vertical LRAS curve accords with the quantity theory of money if we assume that the quantity theory is a long-run theory, ie output Y is fixed in the long run.

2   The Keynesian revolution

2.1   What's included in this section

- Keynes' rejection of classical macroeconomics

- Keynes' analysis of employment and inflation

- Keynesian policies from 1945 to the mid-1970s

- Keynesian models of labour markets and aggregate supply

2.2   Guidance

As a guide to the reading, the following might be of help:

- We will be studying Keynesian theory in much greater detail in the following sections of this module, but the section on Keynes' analysis of employment and inflation is a good overview.

- The labour market model and the *AD-AS* model are fairly recent developments in economic theory, so were not used by Keynes. They are used here to show how his views differed from the classical economists and to show how followers of Keynes are developing his theories.

- This material is new to Subject CB2.

2.3   Reading

Task	*√when completed*
Re-read Module 2, Section 1.8 (the first three paragraphs).	☐
Read Chapter 16, pages 498–502.	☐
Read Chapter 20, pages 638–639 (subsection on Keynesian models of labour markets and aggregate supply).	☐

2.4 Checklist

Task	√ *when completed*
Ensure that you can:	
• define the following key terms:	
– multiplier effect	☐
– fiscal policy	☐
– monetary policy	☐
– demand-management policies	☐
– stop-go policies	☐
• explain how Keynes criticised the classical:	
– policy of cutting wages	☐
– loanable funds theory	☐
– quantity theory of money	☐
– Say's law	☐
• explain why Keynes concluded that a market economy is unlikely to achieve full employment	☐
• explain Keynes' main policy recommendation to achieve full employment and stable prices	☐
• give an example of a fiscal and a monetary policy that could be used:	
– if aggregate demand is too low	☐
– if aggregate demand is too high	☐
• describe the criticisms of Keynesian policies that emerged in the 1960s	☐
• use the labour market model to explain why Keynesian economists believe that the labour market is not always at equilibrium and that demand-deficient unemployment can occur	☐
• use the *AD-AS* model to explain why Keynesian economists believe that the short-run *AS* curve may be horizontal and that the long-run *AS* curve is not vertical.	☐

2.5 Questions

Question

Keynes rejected the classical view that in a recession real wages would fall to clear the labour market because:

I   wages are sticky downwards.

II   a fall in real wages would decrease consumption and further decrease the demand for labour.

III   a fall in wages cuts costs, reduces prices and increases export demand.

Which of the above are correct?

A   I only
B   I and II only
C   I, II and III
D   III only

Solution

Option B. Keynes did not think it would be easy to reduce wages. Wages tend to be inflexible, especially downwards. They are usually set for a whole year, even in non-unionised firms, and wage cuts would be resisted by workers. (Nowadays, it is thought that wage cuts are resisted by employers too because the 'economy of high wages' suggests that productivity might fall if wages were reduced.) Even if wages did fall, it might take a long time, during which workers and the economy would suffer. Also, this essentially micro vision of the labour market overlooks macroeconomic considerations. If real wages in general fall, there will be a decrease in real incomes in the economy, which will lead to a decrease in aggregate demand and hence a decrease in the demand for labour. Option III is the classical argument, not a criticism of it.

Question

Explain why Keynes rejected the quantity theory of money and Say's law.

Solution

The quantity theory of money assumes that real output (Y) is fixed at the full-employment level of output $\left(Y_F\right)$ and that if there is an increase in the money supply prices would rise. However, Keynes said that, if the economy were operating with some slack, *ie* at less than the full-employment level, then an increase in the money supply would lead to an increase in aggregate demand and an increase in output (and employment) rather than a rise in prices.

The quantity theory of money assumed that the economy would always be operating at full employment because of Say's law, *ie* 'supply creates its own demand' (coupled with the assumption that withdrawals equal injections). Keynes reversed Say's law and argued that 'demand creates its own supply', *ie* an increase in aggregate demand encourages firms to produce more to meet it.

Question

Keynesian theory predicts that:

A   an increase in exports increases unemployment.

B   a decrease in withdrawals increases real national income.

C   an increase in taxation increases real national income

D   a decrease in interest rates decreases employment.

Solution

Option B. A *decrease* in withdrawals (savings, taxation, imports) *increases* consumption on domestically produced goods and services and therefore *increases* aggregate demand, which *increases* real output (real national income) and employment. Therefore, an increase in taxation (Option C) would *decrease* national income. An *increase* in injections (investment, government spending, exports) (Option A) increases aggregate demand and hence *increases* real national income and employment. A *decrease* in interest rates (Option D) would increase borrowing and increase consumption and investment, hence leading to an *increase* in real national income and employment.

Question

Using the labour market model, explain why, according to Keynesians, a fall in aggregate demand is likely to lead to demand-deficient unemployment.

Solution

Whereas classical economists assume that wages and prices are flexible, Keynesians believe that market imperfections in the form of price and wage stickiness prevent goods and labour markets from clearing. For example:

* oligopolies are reluctant to compete on price and are characterised by price stickiness

* wages are normally set annually by firms, sometimes by a system of collective bargaining with unions

* firms are sometimes reluctant to reduce wages because it might lead to a fall in productivity

* workers are extremely resistant to wage cuts.

This means that it is often output and employment that change in response to a change in aggregate demand, rather than prices and wages.
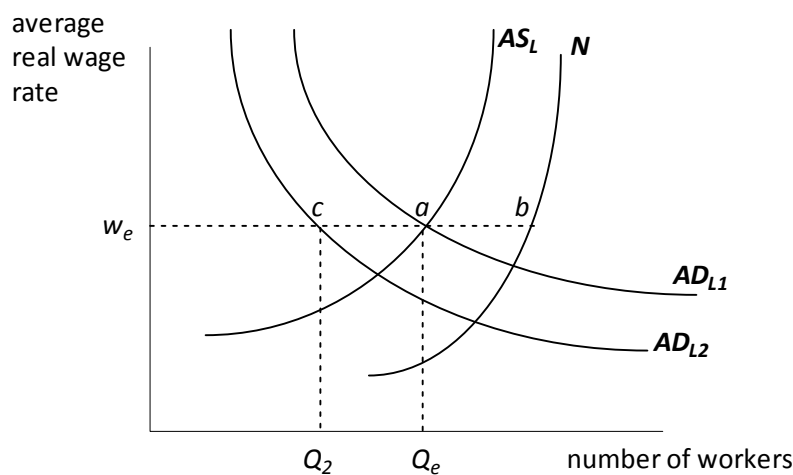
In the above diagram, we assume the labour market is initially in equilibrium at real wage w_e, employment Q_e and natural or equilibrium unemployment (frictional and structural unemployment) of $b - a$.

A decrease in aggregate demand will cause a decrease in output (rather than prices) in the goods market. Since nominal wages are sticky (especially downwards), the real wage does not fall. So, with reduced aggregate demand at an unchanged real wage, there is a decrease in demand for labour from AD_{L1} to AD_{L2}. The level of employment therefore falls to Q_2 and there is demand-deficient unemployment of $a - c$. (Firms might make workers redundant or might reduce working hours.)

How will this be resolved? Prices and wages might respond eventually, but Keynesians believe this could take some time, during which there will be hardship for those unemployed, output will be below its potential level and the long-term potential level might be reduced by the damage inflicted on the economy by a long recession, *eg* loss of skills. Keynesians therefore recommend that governments increase aggregate demand to return to the original equilibrium.

Notice that this means that the Keynesian SRAS curve is perfectly elastic, ie horizontal, in that if aggregate demand changes, output responds with no change in price. It also suggests that the long-run AS curve will slope upwards. We will develop the Keynesian view of the AS curves later in this module.

3   Background to Keynesian theory

3.1   What's included in this section

- The relationship between aggregate demand and national income

- The Keynesian 45-degree line diagram

- Consumption

- Withdrawals

- Injections

3.2   Guidance

As a guide to the reading, the following might be of help:

- An understanding of the concepts discussed in this section is very important, as they underlie the calculations described in the following section.

- Much of this material is familiar from Module 11; it just becomes a bit more technical in this section. Recall from Module 11, that, according to the circular flow of income model:

  – by definition, all income is either spent on domestically produced goods and services or withdrawn from the circular flow, *ie* $Y = C_d + W$

  – by definition, aggregate demand or expenditure (*AD or E*) is the total spending on goods and services made within the country, which includes consumer spending of domestically produced goods plus injections into the circular flow, *ie* $Y = C_d + J$

  – the equilibrium level of national income occurs where injections equal withdrawals.

- It follows from the above, that the equilibrium level of national income occurs where aggregate demand is equal to national income, *ie* $AD(=E) = Y$.

- Box 17.2 discusses the effect of net worth on consumption. Some of the terms are not mentioned in the body of the textbook, *eg* the collateral effect of a change in house prices.

3.3   Reading

Task	*√when completed*
Read Chapter 17, pages 521–532.	☐

3.4　Checklist

Task	√ when completed
Ensure that you can:	

- define the following key terms:
  - aggregate expenditure (E)   ☐
  - endogenous variable   ☐
  - exogenous variable   ☐
  - consumption function   ☐
  - marginal propensity to consume   ☐
  - disposable income   ☐
  - consumption smoothing   ☐
  - credit-constrained households   ☐
  - debt-servicing costs   ☐
  - marginal propensity to save   ☐
  - marginal tax propensity   ☐
  - marginal propensity to import   ☐
  - marginal propensity to withdraw   ☐

- draw a consumption function of the form $C = a + bY$ and explain the relationship between consumption and income   ☐

- discuss the main factors (other than income) that affect consumption   ☐

- describe the difference between the marginal propensity to consume and the marginal propensity to consume out of disposable income   ☐

- distinguish between factors that cause:
  - a movement along the consumption function   ☐
  - a change in the slope of the consumption function, (*ie* change in *b*)   ☐
  - a change in the position of the consumption function (*ie* change in *a*)   ☐

- explain why the consumption function might be steeper in the long run than in the short run   ☐

- draw and explain the relationship between total consumption (C) and the consumption of domestically produced goods and services $\left(C_d \right)$.   ☐

Task	√*when completed*
Continued	
Ensure that you can:	
• draw and explain the withdrawals function $(W = S + T + M)$	☐
• describe the factors that affect:	
– net savings	☐
– net taxes	☐
– imports	☐
• state the relationship between C_d and W	☐
• draw and explain the injections function $(J = I + G + X)$	☐
• discuss the main factors that affect:	
– investment	☐
– government spending	☐
– exports.	☐

3.5   Questions

Question

The following table shows how consumption of domestically produced goods and services varies with income:

National income (Y)	Consumption of domestically produced goods & services (C_d)	Proportion of income consumed
0	20	
10	26	
20	32	
30	38	
40	44	
50	50	
60	56	
70	62	
80	68	
90	74	
100	80	

(i)   Define and calculate the marginal propensity to consume domestic goods and services.

(ii)   State the formula for this consumption function and explain the exogenous component.

(iii)   State the relationship between C_d and W, and hence deduce the formula for the withdrawals function.

(iv)   Draw a diagram to show how C_d and W vary with national income.

(v)   Complete the third column and explain the trend.

(vi)   List five factors (other than income) that influence C_d (and hence withdrawals).

Solution

(i)   The *marginal propensity to consume domestic goods and services* (mpc_d) is the proportion of an increase in national income that is spent on domestically produced goods and services. Using the formula:

$$mpc_d = \frac{\Delta C_d}{\Delta Y} = \frac{6}{10} = 0.6$$

We can see that the mpc_d is constant for all income levels, so the consumption function is a straight line with a gradient of 0.6.

(ii)   Using the formula for a straight line ($C_d = a + bY$), we know that $b = 0.6$ and, by substituting values for C_d and Y, we deduce that $a = 20$. This part of consumption does not depend on income and is therefore exogenous (or autonomous).

We can see therefore that a change in the mpc_d changes the slope of the consumption function, whereas a change in the exogenous part changes the position of the consumption function.

(iii)   We know from the circular flow diagram, that when we earn income, some of it is taken away in taxes, some of it is saved and the rest is spent on either imports or domestically produced goods and service. Algebraically:

$$Y = S + T + M + C_d$$
$$= W + C_d$$

Therefore:

$$W = Y - C_d$$

We know the formula for C_d, so:

$$W = Y - (20 + 0.6Y)$$
$$= -20 + 0.4Y$$

(iv)
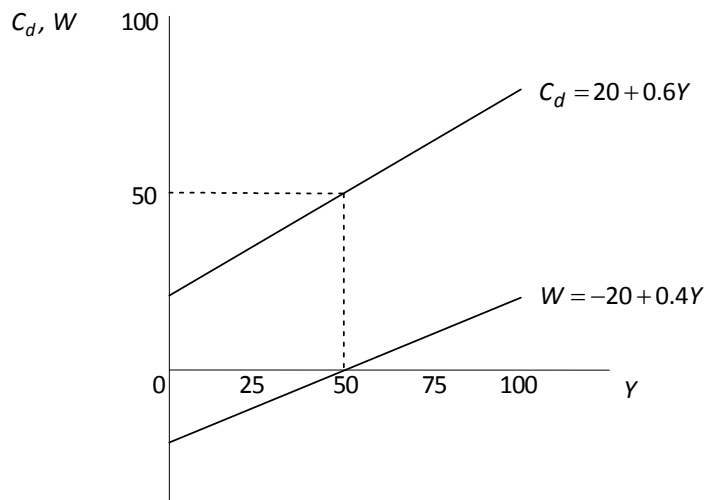
(v)   The proportion of income spent on domestically produced goods and services falls as income increases. The values of C_d/Y are:

infinity, 2.6, 1.6, 1.27, 1.1, 1, 0.93, 0.89, 0.85, 0.82, 0.8

At very low income levels, $C_d > Y$ and $W < 0$. People might draw on savings or borrow to finance their expenditure, or they might receive benefits (*ie* net savings and taxes are negative and outweigh imports). When income reaches 50, $C_d = Y$ and $W = 0$. As income increases beyond 50, $C_d < Y$ and $W > 0$ as people typically add to their savings.

(vi)   Any *five* from:

- expected future income

- availability of credit and interest rates

- household balance sheets and household wealth

- consumer sentiment

- expectations of future prices

- distribution of income

- tastes and attitudes to spending, borrowing and saving

- the age of durables

- availability of attractive savings schemes

- taxation

- prices of home-produced goods relative to the price of imports

- quality of home-produced goods relative to the quality of imports

- tastes/fashion for home-produced goods or imported goods

Question

Which of the following is NOT likely to lead to an increase in investment?

A   a fall in interest rates
B   a rise in consumption
C   a fall in profits
D   improved confidence in the economy

Solution

Option C. One of the major sources of funds for investment is profit that is ploughed back into the business rather than distributed to shareholders as dividends. A fall in profit would mean that businesses would have to look elsewhere to finance any investment. A fall in interest rates (Option A) would make it cheaper to borrow to invest. A rise in consumption (Option B) would raise business expectations and confidence in the economy (Option D) and therefore businesses would increase investment to give them the capacity they need to cope with increased demand.

4   The determination of national income

4.1   What's included in this section

- Equilibrium national income where:

  – $W = J$

  – $Y = E$

- The multiplier seen through:

  – the $W = J$ approach

  – the $Y = E$ approach

- Discretionary fiscal policy: changing T

4.2   Guidance

As a guide to the reading, the following might be of help:

- It is important to realise that in the Keynesian model, when there is a change in injections or withdrawals, it is *national income* (and therefore employment) that changes to restore equilibrium.

- The exam poses many numerical questions on this topic, so it is important to practise them.

- The textbook looks at the injections multiplier in a number of ways. Essentially, we need to understand why a change in injections has a multiplier effect on income and to know and be able to apply the formulae.

- It seems sensible to also study the *taxation* multiplier here, so we have pulled forward the reading on that from a later chapter.

4.3   Reading

Task	√*when completed*
Read Chapter 17, pages 533–538.	☐
Read Chapter 22, page 678 (subsection on discretionary fiscal policy: changing T).	☐

4.4   Checklist

Task	√ when completed
Ensure that you can:	
• define the following key terms:	
– (injections) multiplier	☐
– (injections) multiplier formula	☐
– principle of cumulative causation	☐
• state the two conditions for equilibrium national income	☐
• draw the Keynesian $45°$ diagram showing equilibrium national income where $Y = E$	☐
• draw a diagram to show equilibrium national income where $W = J$	☐
• explain:	
– how equilibrium national income is restored if the economy is not initially at equilibrium	☐
– the effect of a change in injections or withdrawals on the equilibrium level of national income	☐
– why a change in injections has a multiplier effect on national income	☐
• calculate:	
– equilibrium national income within a Keynesian model	☐
– the (injections) multiplier	☐
– the tax multiplier	☐
• derive the formula for the injections multiplier	☐
• explain why the tax multiplier is one less than the injections multiplier.	☐

4.5   Questions

Question

Suppose we have the following information for an economy:

$$Y = 100, \ C_d = 20 + 0.6Y, \ J = 20$$

(i)   Calculate the aggregate demand (or aggregate expenditure) function E.

(ii)   Draw the Keynesian $45°$ diagram showing equilibrium national income where $Y = E$, and check the value of equilibrium national income algebraically.

(iii)   Calculate the withdrawals function W.

(iv)   Draw a diagram to show equilibrium national income where $W = J$ and check the value of equilibrium national income algebraically.

(v)   If the level of national income were 120:

   (a)   what would be the level of aggregate demand?

   (b)   what would be the unplanned increase or decrease in stocks?

   (c)   how would firms change their level of output?

(vi)   Repeat the above analysis for a national income of 80.

(vii)   Calculate the new equilibrium level of national income if exports increase by 10. Illustrate the change on a $45°$ diagram (either the one drawn in part (ii) or a new one).

(viii)   Use your answer to part (vii) to calculate the injections multiplier. Confirm by using the formula for the injections multiplier.

(ix)   Starting from the original position, calculate the new equilibrium level of national income if the marginal propensity to consume domestically produced goods decreases to 0.5.

         Illustrate the change on a $45°$ diagram (either the one drawn in part (ii) or a new one).

(x)   Following the change in part (ix), calculate the new value of the injections multiplier.

Solution

(i)   The aggregate demand function is:

$$E = C_d + J$$

$$= 20 + 0.6Y + 20$$

$$= 40 + 0.6Y$$

(ii)   The Keynesian $45°$ diagram showing equilibrium income is shown below:
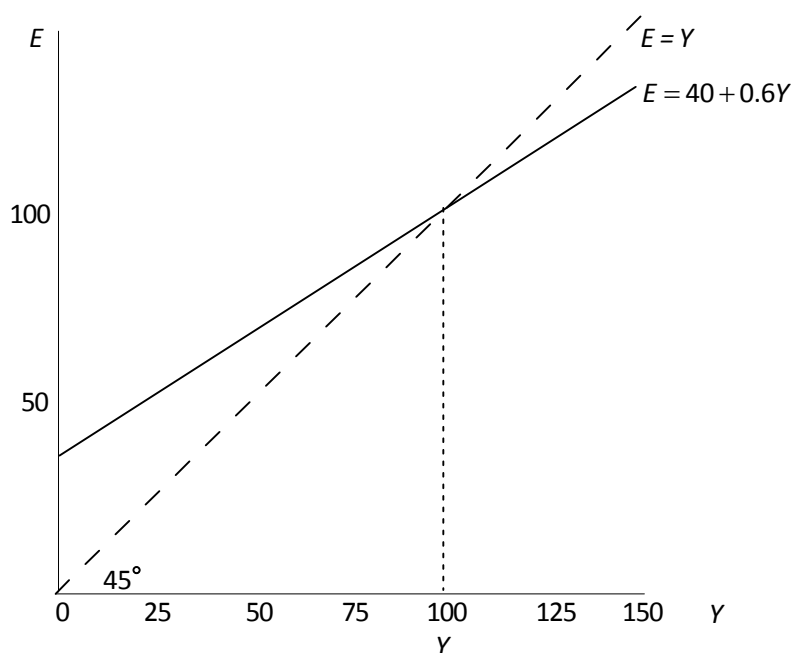
For equilibrium, aggregate demand (or expenditure) must equal aggregate supply (national income), *ie*:

$$E = Y$$

$$40 + 0.6Y = Y$$

$$0.4Y = 40$$

$$Y = 100$$

(iii)   Since income is either spent on domestic goods or withdrawn from the circular flow:

$$W = Y - C_d$$

$$= Y - (20 + 0.6Y)$$

$$= -20 + 0.4Y$$

(iv)   The $W = J$ diagram is shown below:
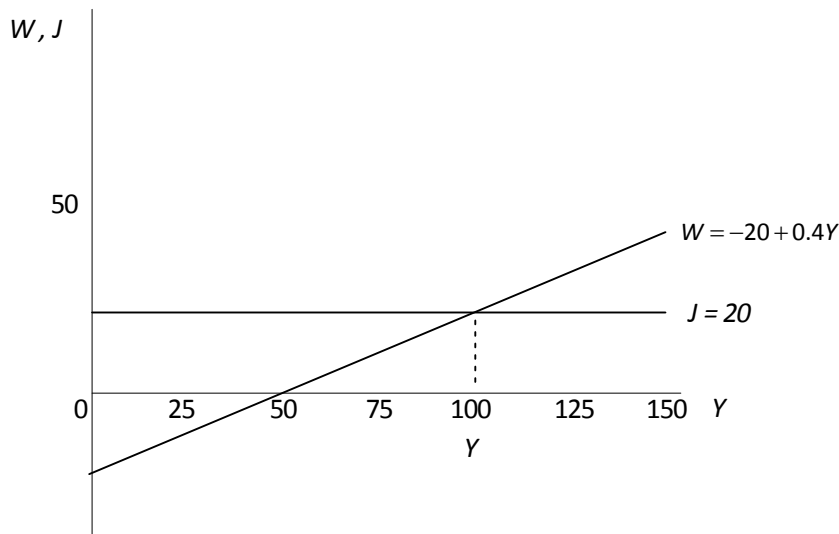
For equilibrium:

$$W = J$$

$$-20 + 0.4Y = 20$$

$$0.4Y = 40$$

$$Y = 100$$

(v)   At income of 120:

(a) $E = 40 + 0.6Y = 40 + 0.6(120) = 112$

(b)   Since 120 has been produced, there is an unplanned *increase* in stocks of 8.

(c)   Firms have produced too much, so they will *reduce* production. Output will fall until the equilibrium level of 100 is reached.

(vi)   At income of 80:

(a) $E = 40 + 0.6Y = 40 + 0.6(80) = 88$

(b)   Since 80 has been produced, there is an unplanned *decrease* in stocks of 8.

(c)   Firms have produced too little, so they will *increase* production. Output will rise until the equilibrium level of 100 is reached.

(vii)   If exports increase by 10, injections increase to 30, then $E_1 = 50 + 0.6Y$. Equilibrium income is found where:

$$E_1 = Y$$

$$50 + 0.6Y = Y$$

$$0.4Y = 50$$

$$Y_1 = 125$$

We can illustrate the change in the Keynesian $45°$ diagram.
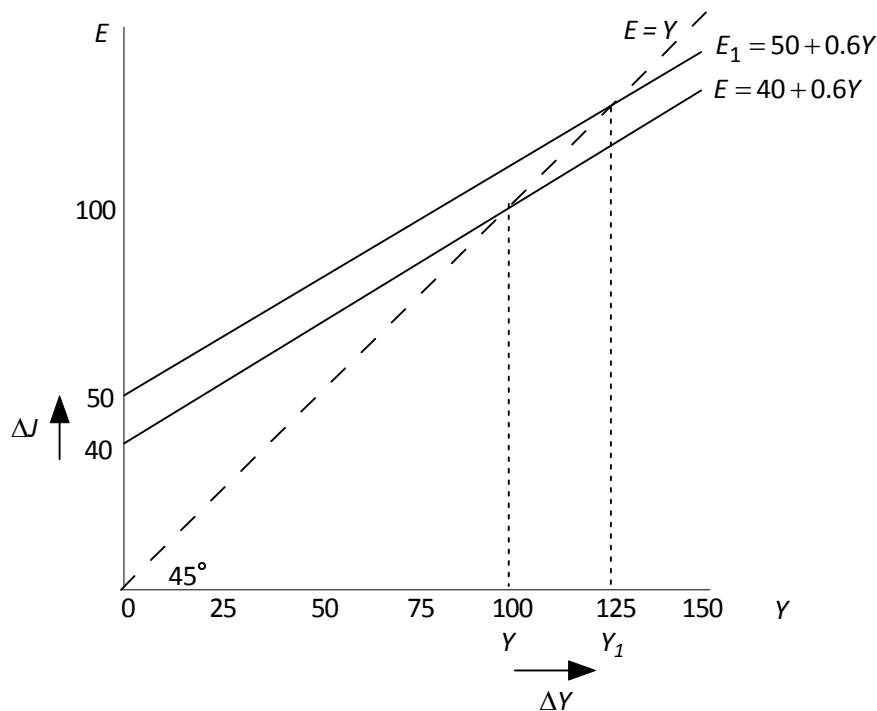
(viii)   We can see from the above that an increase in injections of 10 has brought about an increase in national income of 25. Therefore the multiplier, $k = \Delta Y / \Delta J = 25 / 10 = 2.5$. Using the usual formula:

$$k = \frac{1}{1 - mpc_d} = \frac{1}{1 - 0.6} = \frac{1}{0.4} = 2.5 \quad \text{or} \quad k = \frac{1}{mpw} = \frac{1}{0.4} = 2.5$$

(ix)   If the mpc_d decreases to 0.5, then $E_2 = 40 + 0.5Y$. Equilibrium income is found where:

$$E_2 = Y$$

$$40 + 0.5Y = Y$$

$$0.5Y = 40$$

$$Y_2 = 80$$

We can illustrate the change in the Keynesian $45°$ diagram.
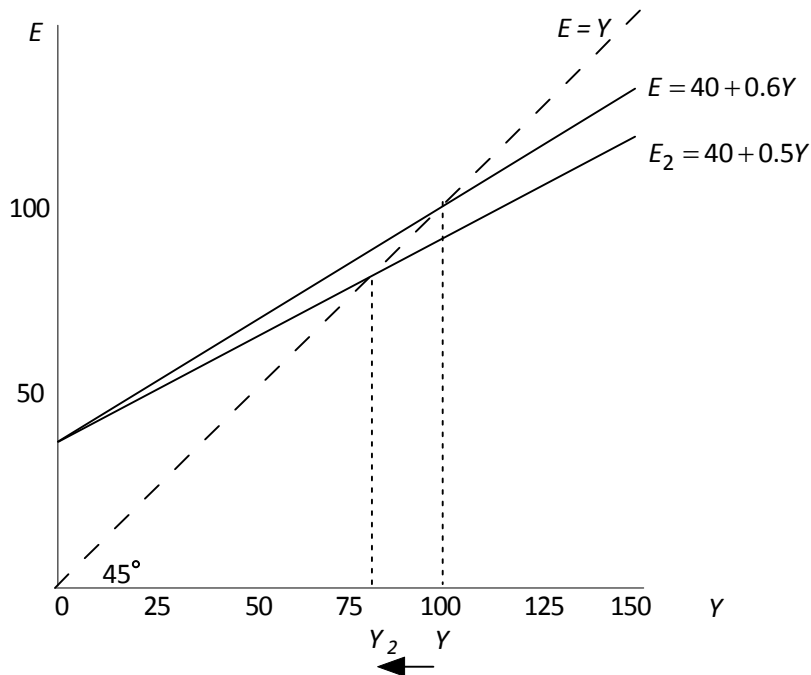
Here a fall in mpc_d (arising from an increase in the marginal propensity to save, to be taxed or to buy imports) has led to a decrease in national income.

(x)   As a consequence of the fall in the mpc_d, the value of the multiplier has fallen. The new value is:

$$k = \frac{1}{1 - mpc_d} = \frac{1}{1 - 0.5} = \frac{1}{0.5} = 2$$

This means that any subsequent change in injections will have a smaller impact on national income.

Notice from parts (vii) to (x) that:

*   *a change in injections has a multiplier effect on national income*

*   *a change in the mpc_d (or the mpw) changes the value of the multiplier.*

Question

Equilibrium in the Keynesian model occurs where:

I   injections = withdrawals

II   aggregate demand = GDP

III $C_d + J = Y$

A   I and II

B   II and III

C   III only

D   I, II and III

Solution

Option D. The equilibrium level of income occurs where aggregate demand or expenditure (E) is equal to GDP or income (Y). (*Recall that GDP is a measure of national income*.) Therefore Statement II is correct. Since $E = C_d + J$, Statement III is also correct. Alternatively, since $E = C_d + J$ and $Y = C_d + W$, $J = W$ is also a condition for equilibrium, so Statement I is also correct.

Question

The multiplier is:

I   the ratio of the change in equilibrium output to the original change in injections that caused the change in output.

II   the inverse of the marginal propensity to withdraw.

III   the ratio of aggregate demand to investment demand.

A   I and II

B   II and III

C   I only

D   III only

Solution

Option A. Statement I is the definition of the injections multiplier. Statement II is one of the ways of calculating the injections multiplier in practice. Statement III is wrong.

Question

The marginal propensity to consume domestically produced goods is 0.8 and the government decides to increase public spending by £100 million. According to Keynesian analysis, what is likely to be the total change in national income resulting from this increased government expenditure?

A   £80 million
B   £125 million
C   £400 million
D   £500 million

Solution

Option D. In this case the injections multiplier is:

$$k = \frac{1}{1 - mpc_d} = \frac{1}{1 - 0.8} = 5$$

Therefore:

$$\Delta Y = k \times \Delta J = 5 \times 100 = 500$$

Question

Explain, with the aid of a numerical example, how the multiplier principle operates.

Solution

The multiplier principle suggests that a change in an injection has a multiplier effect on income, *ie* the equilibrium level of national income will change by a multiple of the change in the injection. This is an example of the *principle of cumulative causation*, which states that an initial change can cause a much larger ultimate change. The *injections multiplier k* is defined as the number of times by which a rise in income exceeds the rise in injections that caused it.

Let us suppose we have an economy in equilibrium with a marginal propensity to consume domestic goods of 0.8 and thus a marginal propensity to withdraw (via savings, taxation and imports) of 0.2. The government then decides to increase its spending on hospitals by £100*m*.

Initially, this will benefit all those directly involved with the new hospital spending, *eg* nurses, doctors, pharmaceutical companies, suppliers of linen and building firms. However, there will be a further effect on the national income as these recipients of income subsequently spend (at least some of) it. All sorts of industries will now benefit from increased orders, *eg* car manufacturers, cinemas and pubs. These industries then expand output to cope with the new demand and thus create further increases in income.

This process of successive increases in spending, output and income continues indefinitely (round and round the circular flow of income) so that the initial increase in government spending results in a larger, *ie* multiplied, increase in national income.

This multiplier effect is demonstrated in the diagram below.
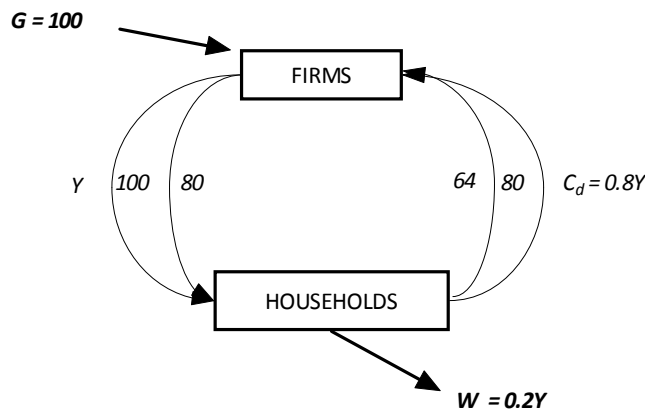
Thus the new income generated from the original increase in government spending is:

$$= 100 + 80 + 64 + \ldots\ldots$$

$$= 100\left(1 + 0.8 + 0.8^2 + \ldots\ldots\right)$$

$$= 100 \times \frac{1}{1 - 0.8} = 100 \times 5 = 500$$

since the sum of the geometric progression $1 + r + r^2 + \ldots\ldots$ (when $0 < r < 1) = \dfrac{1}{1 - r}$.

Thus:

$$\Delta Y = \Delta J \times k$$

where Y is income, J is injections and k is the injections multiplier. A rise in injections of 100 has in this case led to a rise in income of 500.

We can see from the above example that the value of k can be determined by:

$$k = \frac{1}{1 - mpc_d} = \frac{1}{mpw}$$

where mpc_d is the marginal propensity to consume domestic goods and mpw is the marginal propensity to withdraw (in the form of savings, taxes and imports).

The size of the multiplier depends on the mpc_d. The higher the mpc_d, the higher the value of the multiplier.

Question

Prove that the formula for the injections multiplier (*ie* $k = 1/mpw$) can be derived from the definition of the multiplier (*ie* that $k = \Delta Y/\Delta J$).

Solution

Since $k = \Delta Y/\Delta J$ and in equilibrium $W = J$, we know that any change in injections must be matched by a change in withdrawals, *ie* $\Delta W = \Delta J$. Therefore:

$$k = \Delta Y/\Delta W$$

But $mpw = \dfrac{\Delta W}{\Delta Y}$ so $k = 1/mpw$.

Question

Give the formula for the tax multiplier. Explain, with the help of a numerical example, what it means and why it is lower than the injections multiplier.

Solution

The formula for the tax multiplier t_k is:

$$k_t = \frac{mpc_d}{1 - mpc_d} = k - 1$$

It means that a change in a tax that is unrelated to income (sometimes known as a 'lump sum tax') will have a multiplier effect on income and in the opposite direction, *ie* $\Delta Y = -k_t \times \Delta T$.

It is lower than the injections multiplier because when a tax cut is given, households make a decision about how much of it they will spend. Unlike an equivalent increase in government spending, which increases incomes directly, only part of the tax cut will be spent on domestically produced goods (some will be saved, some will go on other taxes and some will be spent on imports) and hence only part of it will create new incomes.

For example, if everyone in a country received a £100 tax cut, amounting to a tax cut of £100 million, and the $mpc_d = 0.8$, the initial effect on spending and new income generated will only be £80 million, *ie* $mpc_d \times \Delta T$. This initial effect will be subject to the usual multiplier effect (which in this case is 5), so:

$$t_k = mpc_d \times \frac{1}{1 - mpc_d} = 0.8 \times \frac{1}{1 - 0.8} = 4$$

Since a tax cut causes a rise in national income:

$$\Delta Y = -k_t \times \Delta T$$

$$= -4 \times (-100)$$

$$= 400$$

A tax cut of £100 million causes an increase in income of £400 million.

5 The simple Keynesian analysis of unemployment and inflation

5.1 What's included in this section

- 'Full-employment' national income

- The deflationary gap

- The inflationary gap

- The multiplier and the full-employment level of national income

- Unemployment and inflation at the same time

- The multiplier and inflation

5.2 Guidance

As a guide to the reading, the following might be of help:

- It is important to realise that in the Keynesian model, equilibrium can occur at any level of national income, and it is therefore unlikely to occur at the full-employment level of income. Consequently, according to Keynes, governments should manage the level of aggregate demand to achieve full employment and stable prices. This policy of demand-management involves the use of fiscal policy and monetary policy, which are discussed in detail in Modules 20 and 15 respectively.

- A common mistake made by students arises in the measurement of deflationary and inflationary gaps. Deflationary and inflationary gaps are defined in terms of the amount by which *aggregate demand* is deficient or excessive (and *not* the amount by which equilibrium income is deficient or excessive) and is therefore represented by a *vertical* distance on a standard 45-degree diagram.

- The discussion about the relationship between unemployment and inflation is relevant to the discussion about the shape of the aggregate supply curve. If an increase in aggregate demand causes:
  - only output to increase, the *AS* curve must be horizontal
  - only prices to increase, the *AS* curve must be vertical
  - both to increase, the *AS* curve must slope upwards.

5.3 Reading

Task	√when completed
Read Chapter 17, pages 538–541.	☐

5.4   Checklist

Task	√ when completed
Ensure that you can:	
• define the following key terms:	
– full-employment level of national income	☐
– deflationary (or recessionary) gap	☐
– inflationary gap	☐
• draw diagrams to show and describe policies to close:	
– a deflationary gap	☐
– an inflationary gap	☐
• explain why an inflationary gap might close automatically	☐
• draw, and explain the shape of, the aggregate supply curve that is:	
– implied by the simple Keynesian model	☐
– likely in practice	☐
• explain why unemployment and inflation can exist at the same time	☐
• explain how the existence of unemployment and inflation at the same time impedes demand-management policies	☐
• explain why the multiplier process following an increase in aggregate demand reduces as the economy approaches full employment and ceases to operate when the economy reaches full employment.	☐

5.5   Questions

Question

(i)   Draw a diagram and explain the concept of:

    (a)   a recessionary (or deflationary) gap

    (b)   an inflationary gap.

(ii)   Describe the policies that Keynesian economists would recommend in each case.

(iii)   With reference to part (i), draw and explain the aggregate supply (*AS*) curve and the corresponding Phillips curve (*PC*) implied by the simple Keynesian model.

Solution

(i)(a)   *A recessionary (or deflationary) gap*
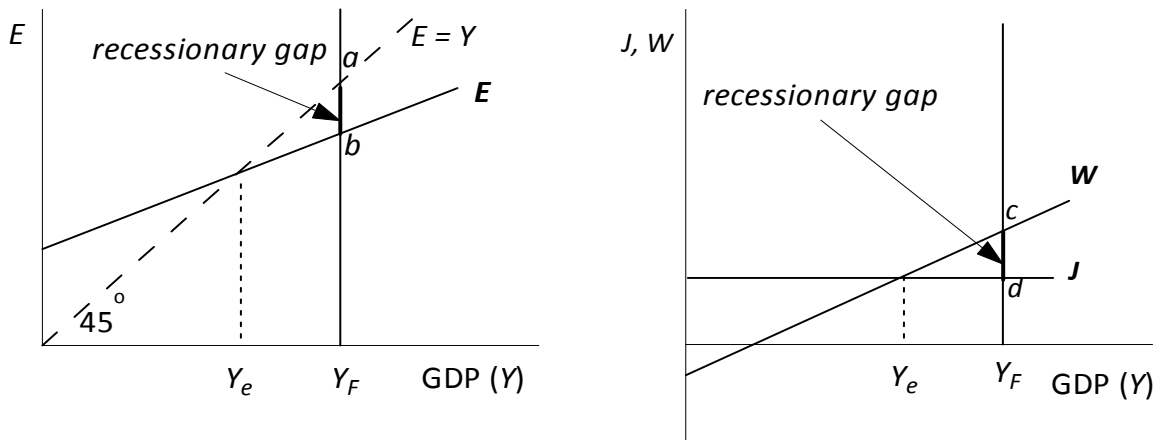
The *recessionary gap ab* shows the extent to which aggregate demand or aggregate expenditure E is deficient at the full-employment level of income Y_F. (Alternatively, using the injections/withdrawals approach, *cd* is the recessionary gap. It shows the amount by which withdrawals exceed injections at the full-employment level of income.) As a consequence, the equilibrium level of income Y_e is lower than Y_F and the economy is suffering from demand-deficient unemployment.

(i)(b)   *An inflationary gap*
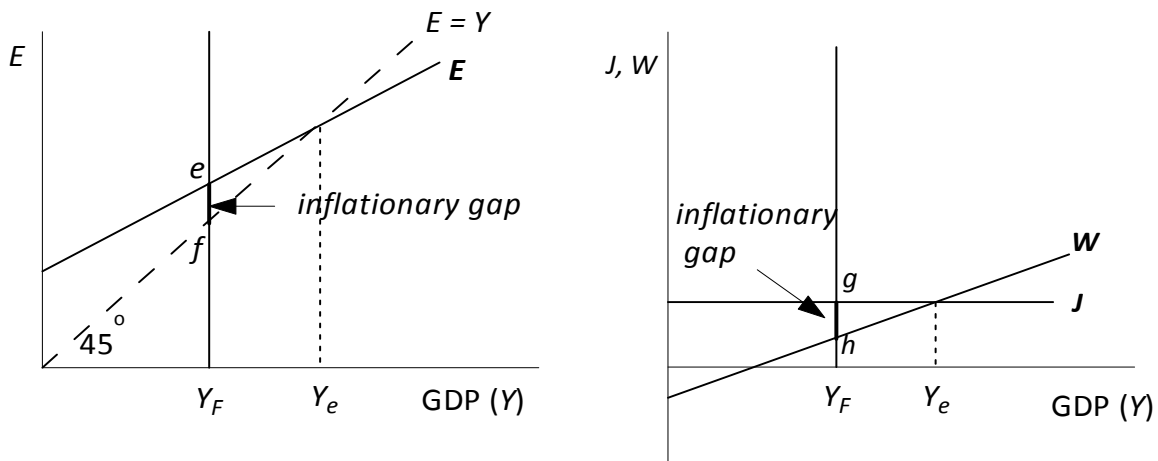
The *inflationary gap ef* shows the extent to which aggregate demand or aggregate expenditure E is excessive at the full-employment level of income Y_F. (Alternatively, using the injections/withdrawals approach, *gh* is the inflationary gap. It shows the amount by which injections exceed withdrawals at the full-employment level of income.) As a consequence, the equilibrium level of income Y_e is higher than Y_F, *ie* the economy is striving for a level of income that it cannot attain or at least sustain, and so the economy is suffering from demand-pull pressure on prices.

(ii)   **Keynesian policies**

Aggregate demand needs to be increased by the amount of the recessionary gap. This could be achieved by, for example, increases in government spending, decreases in taxation, reductions in interest rates and/or an increase in the availability of credit.

Aggregate demand needs to be decreased by the amount of the inflationary gap, by for example, decreases in government spending, increases in taxation, increases in interest rates and/or a decrease in the availability of credit.

(iii)   ***The AS curve and the Phillips curve implied by the simple Keynesian model***
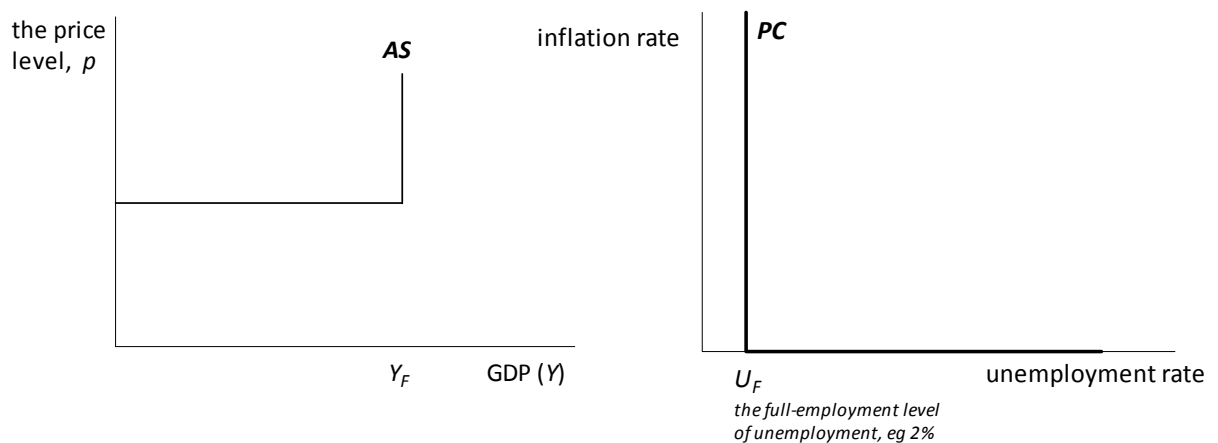
The *AS* curve implied by the simple Keynesian model is horizontal (*ie* perfectly elastic) up to the full-employment level of output and then it is vertical (*ie* perfectly inelastic). This implies that the Phillips curve is vertical at the full-employment level of unemployment (when the only unemployment arises from people changing jobs) and horizontal at zero inflation at other levels of unemployment.

This is because it is assumed that if there is a deflationary gap and the economy is suffering from unemployment, aggregate supply will respond to an increase in aggregate demand with no need for an increase in prices, *ie* as long as the economy has sufficient resources, output can increase and unemployment can decrease without an increase in the price level.

However, once full capacity has been reached, output cannot increase any further because unemployment cannot fall any further. Therefore, if aggregate demand increases when the economy is at full capacity, there is an inflationary gap. Output is fixed, unemployment is fixed and prices increase.

Most economists, including Keynesians, believe that the AS curve is less extreme and slopes upwards and that the Phillips curve slopes downwards.

Question

Unemployment and inflation can co-exist because of:

I   structural unemployment.
II   cost-push inflation.
III   firms operating with different degrees of slack.

A   I only
B   I and II
C   I and III
D   I, II and III

Solution

Option D.

Whereas demand-deficient unemployment and demand-pull inflation are unlikely to occur at the same time (since one is caused by too little demand and the other by too much), structural unemployment can occur at any level of inflation, and cost-push inflation can occur at any level of unemployment.

If firms operate at different levels of capacity, it is possible that an increase in aggregate demand in a depressed economy might result in most firms increasing output to satisfy the demand but other firms increasing prices because they have no spare capacity. This will be more likely as the economy as a whole approaches full capacity. A consequence of this is that the *AS* curve is likely to slope upwards and to become steeper as output approaches its full-employment level.

Question

An increase in injections will:

A   increase national income, unemployment, inflation and imports.
B   decrease national income, unemployment, inflation and imports.
C   increase national income, inflation and imports, and decrease unemployment.
D   increase national income and inflation and decrease unemployment and imports.

Solution

Option C. An increase in injections (investment, government spending and/or exports) will increase aggregate demand, increase sales (including sales of imports), increase employment and increase national income. As aggregate demand increases, the rate of inflation will tend to increase. The extent of demand-pull inflationary pressure will be greater, the closer the economy is to full capacity, and hence, the greater the difficulty firms have in trying to meet the demand.

6   The Keynesian analysis of the business cycle

6.1   What's included in this section

- Volatility of aggregate demand

- Instability of investment: the accelerator

- Multiplier/accelerator interaction

- Fluctuations in stocks

- Fluctuations in borrowing and debt

- Determinants of the course of the business cycle

6.2   Guidance

As a guide to the reading, the following might be of help:

- The business cycle was described in Module 12 so it might be worth revisiting it now.

- The topic of this section is the business cycle in the context of the Keynesian school of thought. Much of what is written in this section are the views of Keynesians, the followers of Keynes, rather than Keynes himself. They believe that fluctuations in aggregate demand explain cyclical fluctuations in the economy. Consumption and investment are major components of aggregate demand and therefore major influences on the business cycle. Their determinants were discussed in Section 3 of this module.

- We will return to the topic of the business cycle when we discuss the radically different view of the new classical economists in Module 17.

- Since the business cycle appears elsewhere in the course, long questions on this topic, which have appeared in previous exam papers, would require the different sections to be brought together. It might therefore be worth writing a rough plan encompassing the following three sections of notes:

    – The description of the business cycle, covered in Module 12 (Section 1)

    – The Keynesian view, covered in this section

    – The new classical view, which will be discussed in Module 17 (Section 2).

6.3   Reading

Task	√when completed
Read *Chapter 17*, pages 541–548, excluding Box 17.5.	☐

6.4 Checklist

Task	√ when completed
Ensure that you can:	
• define the following key terms:	
− accelerator theory	☐
− induced investment	☐
− accelerator coefficient	☐
− marginal capital/output ratio	☐
• explain the Keynesian view of the causes of the business cycle in terms of fluctuations in aggregate demand, particularly private sector spending, compounded by market imperfections	☐
• explain the accelerator theory of investment	☐
• explain why the size of the accelerator effect is difficult to predict	☐
• discuss how the multiplier and accelerator interact to increase the swings in output over the course of the business cycle	☐
• describe changes in the following over the course of the business cycle:	
− stocks	☐
− borrowing and debt	☐
• give three reasons for the persistence of booms and slumps	☐
• give six reasons for turning points in the business cycle.	☐

6.5 Questions

Question

According to the accelerator theory, investment expenditure will:

A   fluctuate more than consumer expenditure.

B   rise when the long-term rate of interest falls.

C   accelerate if business confidence picks up.

D   accelerate if the government increases its capital expenditure.

Solution

Option A. According to the accelerator theory, small fluctuations in national income, of which consumer expenditure is a significant part, can lead to large fluctuations in investment demand. The correct answer is therefore Option A. Investment expenditure might rise when interest rates fall (Option B) but this has nothing to do with the accelerator. Options C and D are red herrings with the word 'accelerate' thrown in.

Question

Which of the following explains the way in which borrowing amplifies the business cycle?

A   Banks help customers to engage in consumption smoothing by allowing them to borrow against expected future incomes.

B   Banks are more willing to lend in a boom and less willing to lend in a slump.

C   A fall in the value of financial and non-financial assets encourages households to increase savings and debt repayments and decrease spending.

D   An increase in the rate at which income is rising will lead to an increase in investment.

Solution

Option B. The financial sector can accelerate a boom and a slump because of the way in which it responds to the state of the economy, *eg* by becoming more willing to lend in a boom. Consumption smoothing and the banks' role in this (Option A) *reduces* the volatility in consumption relative to the volatility in income. A fall in the value of financial and non-financial assets can encourage households to decrease spending (Option C) to restore their balance sheets and hence help to bring about a recession, but this is not a result of a change in borrowing. Option D describes the accelerator.

Question

The accelerator effect will not be as great as that predicted by the accelerator theory for all of the following reasons except:

A   Firms that produce consumer goods will have some slack.
B   Firms that produce capital goods will have some slack.
C   Firms might have anticipated a change in demand.
D   Firms are unable to change their long-term plans.

Solution

Option B. The accelerator theory assumes that the capital goods sector has plenty of slack to meet the needs of the consumer goods industry for new machinery *etc*. This enables firms to invest as the theory predicts. The theory also assumes that firms producing consumer goods have no slack (and therefore must invest to cope with new demand). However, if the consumer goods sector has some slack (Option A), it will be able to meet demand without new investment. Similarly, if firms have anticipated a change in demand (Option C), they might have made the necessary investment prior to the change in national income. Finally, firms may make long-term plans for investment (Option D) and be unable to change them in response to a change in national income.

Question

A recession will tend to come to an end when:

A   firms are reaching full capacity.
B   the government adopts contractionary economic policies.
C   investment falls.
D   consumer durables and capital equipment need replacing.

Solution

Option D.   Consumer durables, such as washing machines and cars, last many years, so in a recession, people often 'make-do' with what they have rather than buy new versions at an uncertain time. The same is true of capital equipment. However, eventually, these will need to be replaced, and this 'echo effect' can trigger a recovery. The other three options are characteristics of the end of a boom period.

Module 16 Practice Questions

16.1   The quantity theory of money assumes that the:

A   velocity of circulation and nominal output are reasonably stable.

B   ratio of the velocity of circulation to the price level is reasonably stable.

C   ratio of the money supply to the velocity of circulation is reasonably stable.

D   velocity of circulation and real output are reasonably stable.   [1½]

16.2   Keynes rejected the classical view that people should be encouraged to save to get out of recession because increased savings will:

A   be channelled into investment.

B   reduce interest rates and hence the currency.

C   reduce consumption and hence investment.

D   improve confidence and increase investment.   [1½]

16.3   Which of the following are indicated by this consumption function?
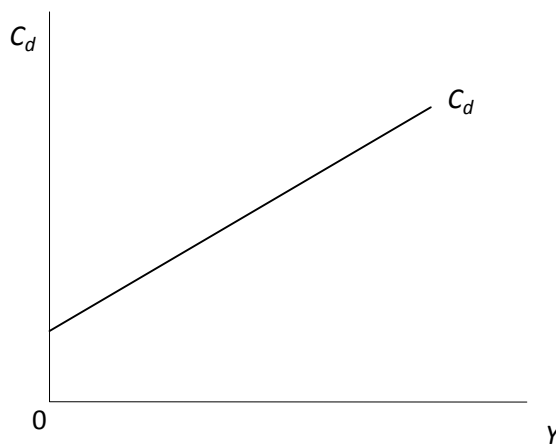
A   a diminishing marginal propensity to consume domestically produced goods and services

B   positive savings and taxes at all income levels

C   a constant proportion of income being spent on domestically produced goods and services

D   consumption on domestically produced goods and services being greater than income at some income levels.   [1½]

16.4   You are given the following information about the level of aggregate demand (aggregate
        expenditure) at different levels of national income. You are also told that taxation is 20% of
        national income. Figures are given in £ millions.

National income	Consumption	Investment	Government Expenditure	Exports	Imports
100	70	20	50	30	10
200	140	20	50	30	20
300	210	20	50	30	30
400	280	20	50	30	40

(i)   Calculate the equilibrium level of national income.   [1]

(ii)   Calculate the fiscal position (surplus, deficit or balance) at the equilibrium level of
        income.   [1]

(iii)   Assuming the economy is initially in equilibrium, calculate the effect on the current
        account balance of an increase in investment of £20 million.   [2]
                                                                                  [Total 4]

16.5   Consumption on domestically produced goods and services (C_d) is given by:

        $$C_d = £100m + 0.8(Y - T)$$

where Y = income

        T = tax revenue

If both government expenditure and taxes are raised by £10 million each, the equilibrium level of
national income will:

A   remain unchanged.
B   rise by £8 million.
C   rise by £10 million.
D   rise by £50 million.   [1½]

16.6   When national income is less than full-employment national income, by how much must aggregate

Exam style   demand be increased to achieve full employment?

   A   the amount by which the equilibrium level of national income falls short of the full-
           employment level

   B   the amount by which injections exceed withdrawals at the full-employment level of
           output

   C   the amount by which national income exceeds aggregate demand at the full-employment
           level of national income

   D   the size of the balance of payments deficit at the full-employment level of national
           income   [1½]

16.7   Which of the following is inconsistent with the co-existence of unemployment and inflation?

Exam style   A   structural unemployment
   B   a downward-sloping Phillips curve
   C   a smaller multiplier effect than in an economy with no inflation
   D   a horizontal *AS* curve

16.8   The accelerator principle states that:

Exam style   A   investment is increased when interest rates fall.

   B   an increase in investment will lead to a more than proportionate increase in output.

   C   the level of investment expenditure is determined by the rate of change of national
           income.

   D   investment is increased when interest rates rise.   [1½]

16.9   Discuss the role that consumption plays in the business cycle.   [10]

Exam style

16.10   Describe the accelerator theory and explain how it can be used to explain business cycles.   [10]

Exam style

The solutions start on the next page so that you can
separate the questions and solutions.

![ABC] Module 16 Solutions

16.1   This question is Subject 107, April 2002, Question 19 (amended).

Option D. In the quantity theory of money ($M\overline{V} = P\overline{Y}$), velocity of circulation (V) and *real* output (Y) are assumed to be relatively stable. (The theory therefore predicts that an increase in the money supply will lead to the same percentage increase in prices.)   [1½]

16.2   Option C.

Classical theory suggested that an increase in savings would lead to a fall in interest rates and therefore an increase in demand for loanable funds for investment. The extra demand for investment goods would increase output and hence employment.

However, according to Keynes, increased savings would mean reduced consumption. Also, investment is not very responsive to a fall in interest rates. It is more likely to be affected by business confidence, and the fall in business confidence arising from a reduction in consumption would be likely to lead to a *decrease* in investment. Consumption and investment are two key components of aggregate demand, so there would be a decrease in output and hence employment.   [1½]

16.3   Option D.
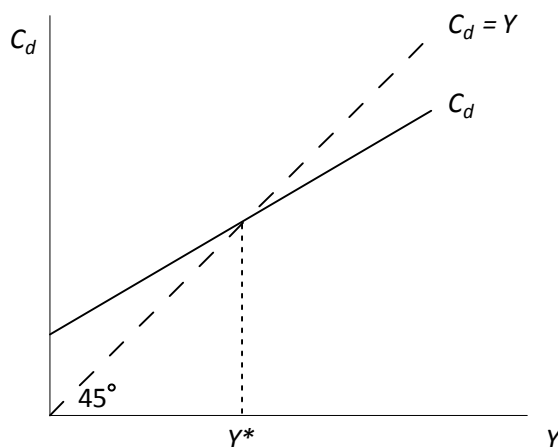
The diagram above reproduces the consumption function and adds a $45°$ line, which shows the locus of points at which $C_d = Y$. We can see that at an income level of $Y*$, $C_d = Y$; at levels of income below $Y*$, $C_d > Y$ and $W < 0$; and at levels of income above $Y*$, $C_d < Y$ and $W > 0$.

This tells us that the proportion of income spent on domestically produced goods (C_d/Y) falls as income increases (so Option C is not correct); that consumption on domestically produced goods is greater than income at some income levels (so Option D is correct); and that savings and taxes are not positive at all income levels (so Option B is not correct). The mpc_d is equal to the slope of the consumption function. Since it is a straight line, the mpc_d must be constant (so Option A is not correct).   [1½]

16.4 **(i)** ***Equilibrium income***

Equilibrium income is found where aggregate demand (or expenditure) is equal to income.

Aggregate demand (or expenditure) is:

$$E = C + I + G + X - M$$

or alternatively:

$$E = C_d + I + G + X \text{ where } C_d = C - M$$

From the table we can see that:

$$C = 0.7Y, \ I = 20, \ G = 50, \ X = 30, \ M = 0.1Y$$

Thus, $E = 100 + 0.6Y$, and equilibrium income is found where:

$$100 + 0.6Y = Y$$
$$100 = 0.4Y$$
$$Y = 250$$

Alternatively, equilibrium is found where injections = withdrawals.

From the table, we can see that $J = I + G + X = 100$.

Since $T = 0.2Y$, $M = 0.1Y$, $C_d = 0.6Y$ and $Y = C_d + S + T + M$, then $S = 0.1Y$.

Thus withdrawals = $S + T + M = 0.1Y + 0.2Y + 0.1Y = 0.4Y$.

Equilibrium income is where $J = W$, ie $100 = 0.4Y \Rightarrow Y = 250$.   [1]

(ii) ***Fiscal position***

There is a fiscal surplus if tax receipts exceed government spending and a fiscal deficit if government spending exceeds tax receipts.

If $Y = 250$, $T = 0.2Y = 50$ and $G = 50$. Therefore, the budget is in balance.   [1]

(iii) ***The effect of an increase in investment***

If investment increases by 20, then aggregate demand increases to $E = 120 + 0.6Y$.

Setting this equal to income gives the new equilibrium income of 300.

Alternatively, the new equilibrium income can be found by using the multiplier.

$$k = \frac{1}{1 - mpc_d} = \frac{1}{1 - 0.6} = 2.5$$

where mpc_d is the marginal propensity to consume domestic goods out of total national income.

Therefore:

$$\Delta Y = k \times \Delta I = 2.5 \times 20 = 50$$

So income increases by 50 to its new equilibrium level of 300.   [1]

If income increases, exports are unchanged at 30 but imports increase.

When $Y = 250$, $X = 30$ and $M = 0.1Y = 0.1(250) = 25$. So $(X - M) = 5$.

When $Y = 300$, $X = 30$ and $M = 0.1Y = 0.1(300) = 30$. So $(X - M) = 0$.   [½]

Therefore, the current account falls from a surplus of 5 into balance.   [½]

[Total 2]

16.5   Option C.

We can see from the consumption function that tax is unrelated to income, *ie* it is a lump-sum tax. We could rewrite it as:

$$C_d = \pounds100m - 0.8T + 0.8Y$$

This means that an increase in taxation of £10 million would decrease consumption by £8 million. If, at the same time, government spending increases by £10 million, then overall there would be a net increase in spending of £2 million. This would be subject to the multiplier, which is:

$$k = \frac{1}{1 - mpc_d} = \frac{1}{1 - 0.8} = 5$$

So national income would increase by £10 million.

Alternatively:

$$k = \frac{1}{1 - mpc_d} = \frac{1}{1 - 0.8} = 5 \text{ and so a } \pounds10m \text{ increase in } G \text{ leads to a } \pounds50m \text{ } \textit{increase} \text{ in } Y$$

$$k_t = \frac{mpc_d}{1 - mpc_d} = k - 1 = 4 \text{ and so a } \pounds10m \text{ increase in } T \text{ leads to a } \pounds40m \text{ } \textit{decrease} \text{ in } Y$$

Therefore a £10*m* increase in G and T leads to a £10*m* increase in Y.   [1½]

16.6   Option C. The economy is in equilibrium at less than full-employment national income. Option A describes the amount by which *national income* must increase. However, as a result of the multiplier effect, aggregate demand does not have to increase by as much as this. The amount by which aggregate demand must increase is the *deflationary* or *recessionary* gap. Option C gives the amount by which aggregate demand is deficient. An increase in injections of this amount will, as a result of the multiplier effect, lead to the required increase in income. Option B describes an inflationary gap. Option D only considers exports and imports, rather than the full picture of injections and withdrawals.   [1½]

16.7   Option D.

The *AS* curve shows the relationship between the price level (on the vertical axis) and the total output produced (on the horizontal axis). If the *AS* curve is horizontal, it means that output can increase or decrease without there being any change in the price level. This means that the level of unemployment could change as output changes but there would be no inflation.

The other three options are consistent with the experience of unemployment and inflation at the same time:

*   Even when there is high aggregate demand and no demand-deficient unemployment, there could be structural unemployment co-existing with inflation.

*   The Phillips curve shows an inverse relationship between unemployment and inflation, suggesting that when aggregate demand is low, unemployment will be high and inflation will be low; and when aggregate demand is high, unemployment will be low and inflation will be high. This relationship does *not* suggest that when aggregate demand is low, unemployment will be high and inflation will be *zero*; and when aggregate demand is high, unemployment will be *zero* and inflation will be high.

*   If an increase in aggregate demand can lead to an increase in *the price level* as well as an increase in real output, an injection will not increase real output by the full extent of the multiplier. This corresponds to an upward-sloping *AS* curve (and does not preclude the co-existence of unemployment and inflation).   [1½]

16.8   *This question is Subject CT7, September 2008, Question 15.*

Option C. According to the accelerator principle, investment expenditure is determined by the rate of change of national income. Although Option A is generally true, it isn't a statement of the accelerator principle. Option B is concerned with the effect of a change in investment on output (income), rather than the effect of a change in income on investment, *ie* the direction of causation is incorrect. Finally, Option D contradicts Option A and so generally isn't true.   [1½]

16.9   Consumption is typically the largest component of aggregate demand, so any changes in consumption are likely to cause a significant shift in aggregate demand and output.   [1]

Consumption is likely to be affected by disposable income, *ie* income that is available for spending or saving, after the deduction of direct taxes (*eg* income tax) and the addition of benefits (*eg* social benefits).   [1]

Changes in disposable income (and so national income) across the business cycle could therefore lead to similar changes in consumption.   [1]

However, consumption is typically less volatile than disposable income because households often smooth their levels of consumption over time. This c*onsumption smoothing* helps to reduce the volatility in the business cycle.   [1]

Consumption smoothing may also be helped by financial institutions that allow households to borrow against their expected future incomes and save when incomes are high.   [1]

On the other hand, the actions of financial institutions sometimes *increase* volatility in consumption. This is because their ability and willingness to lend might be influenced by the economic climate. [1]

For example, lenders may be more willing to lend in a boom when confidence is high (thus increasing spending further) and less willing to lend in a recession when they might doubt individuals' ability to repay (thus decreasing spending and deepening the recession). [1]

Consumers will contribute to this too since they are more willing to borrow (to spend) in a boom and less willing to borrow in a slump. [½]

In fact, it seems likely that the credit boom will ultimately cause a turning point in the business cycle. If a boom has encouraged people to take on too much debt, borrowers might reach a point at which they fear their ability to repay in the future, so they increase loan repayments to restore their balance sheets. [½]

This is likely to occur when asset values fall (*eg* property values) because the value of wealth (*eg* bonds and property) is an important determinant of consumption. [½]

Another possible cause of the change in attitude could be a rise in debt-servicing costs, *eg* a rise in mortgage rates. [½]

Consumer sentiment and its effect on spending can further explain the persistence of stages in the business cycle. [½]

For example, in an upturn, buoyant expectations for the economy might lead individuals:

- to expect their jobs to be secure and their incomes to rise in the future, so they feel confident to spend more [½]

- to expect prices to rise, so they might spend more now, especially on durable goods, such as cars and furniture. [½]

Consumer spending on consumer durables could provide another reason for turning points in the business cycle. For example, if individuals have reduced spending on durable goods when economic activity is low, then at some point, they will need to increase spending on them as they wear out / break. This spending may help to bring the recession to an end. [1]

[Maximum 10]

16.10 The *accelerator theory* states that investment is determined by the rate of change of national income, and as a result tends to be subject to substantial fluctuations. [1]

In order to produce output a country needs capital goods. The purchase of new capital goods is called investment. [½]

Capital goods become worn out over time and will eventually need to be replaced. When the economy is in a stable equilibrium the investment needed each year will be that needed to replace the worn-out capital goods, *ie replacement investment*. [1]

If national income rises, then the level of capital needed to produce more goods and services also rises. This is called *induced investment*, since it is brought about by the additional demand for goods and services. [1]

The amount of induced investment depends on the change in national income, *ie* $I = \alpha \Delta Y$, where α, *the accelerator coefficient*, is the amount by which induced investment depends on national income. [1]

The accelerator coefficient is equal to the *marginal capital-output ratio*, *ie* the amount of extra capital (in money terms) needed to produce a £1 increase in national output. [1]

So, if $\alpha = 2$, $I = 2\Delta Y$, and an increase in income of £1 million *pa* would lead to induced investment of £2 million. [½]

Interestingly, according to this theory, if national income increases by the same amount each year, induced investment will be constant, but if national income increases by more each year, induced investment will rise. [1]

Since investment is an injection into the circular flow, any increase in induced investment has a multiplier effect on income, so the multiplier and accelerator interact to amplify the boom in income. [1]

However, when the rate of increase in national income slows down, as it must eventually, *eg* due to a shortage of resources, induced investment will fall. This could be a turning point in the business cycle, as this fall in induced investment will have a multiplier effect on income. [1]

If national income is constant, there will be no induced investment; only replacement investment will take place; and if national income falls, replacement investment falls, possibly to zero. [1]

When the economy is in a slump, eventually a turning point is reached. This is maybe because investment starts to increase again, as the worn-out or obsolete capital stock needs to be replaced (echo effects). [½]

A small increase in investment will lead to a larger increase in national income (via the multiplier). This then causes investment to increase again (via the accelerator) and an upward cycle begins. [1]

The accelerator theory thus helps to explain why business cycles occur. [½]

[Maximum 10]

17

Monetarist and new classical schools, and Keynesian responses

Syllabus objectives

1.2 Assess the main strands of economic thinking.

3.9 Discuss what determines the level of business activity and how it affects unemployment and inflation.

 4. Describe the relationship between unemployment and inflation and whether the relationship is stable.

 5. Discuss how business and consumer expectations affect the relationship between unemployment and inflation and explain how such expectations are formed.

 6. Describe how a policy of targeting inflation affects the relationship between unemployment and inflation.

 7. Describe what determines the course of a business cycle and its turning points.

 8. Discuss whether the business cycle is caused by changes in aggregate demand or changes in aggregate supply (or both).

Core Reading

Chapter 16 (Sections 4 and 5)   *Pages 502–510*

Chapter 21 (Sections 1 and 2)   *Pages 646–652*

0   Introduction

Section 1 of this module describes the challenge to the Keynesian orthodoxy made in the 1970s by a group of economists who became known as *monetarists*. With a backdrop of high inflation and low economic growth, monetarists, led by Milton Friedman, argued that governments should keep tight control of the money supply in order to control inflation. In marked contrast to Keynes, they believed that the market economy would, in the long run, automatically correct any deviation from what they called the 'natural' level of employment. The implication of this belief is that the long-run *AS* curve and the long-run Phillips curve are both vertical.

The *new classical economists* (covered in Section 2) went further, and suggested that price and wage flexibility allows markets to adjust continuously, so that the economy operates at its natural level of employment in both the short run and the long run (and that therefore the short-run *AS* curve and the short-run Phillips curve are both vertical). They also put forward the real business cycle theory, which suggests that supply-side shocks explain the business cycle.

Sections 3 and 4 of this module examine in detail some specific developments in economic theory made by the monetarist and new classical schools. In Section 3, we look at *expectations-augmented Phillips curves*; and in Section 4, we examine the *accelerationist theory of inflation*.

The Keynesian response is examined in Section 5. The followers of Keynes can be divided into three distinct schools:

1.   the neo-Keynesian

2.   the new Keynesian

3.   the post-Keynesian.

It is the group known as the *new Keynesians* that has responded most to the work of the new classical economists. This group believes that market imperfections, such as price-stickiness, mean that output and employment (rather than prices) often change in response to new conditions.

Although some of the individual theories of the different schools of thought have been discussed in previous syllabuses, the CB2 syllabus gives greater emphasis to the overall view of each school and to the development of economic thought.

1 The monetarist school

1.1 What's included in this section

- Origins of monetarism

- The monetarist counter-revolution:
    - Quantity theory of money
    - Vertical long-run Phillips curve

1.2 Guidance

As a guide to the reading, the following might be of help:

- This section provides an introduction to the views of the monetarist school on two key economic theories: the quantity theory of money and the Phillips curve.

- The *quantity theory of money* was an important part of classical theory, which we introduced in Module 16 and will further discuss in Module 18. In this module, we focus on the development of the theory by the monetarist school and the increased attention given to their policy recommendations in the 1970s. Notice that monetarists, like the classical economists, assume that the velocity of circulation and real income (or output) are independent of the money supply, and so conclude that an increase in the money supply will increase prices. Since inflation is damaging to the economy, monetarists argue that there should be tight controls on the money supply and recommend that governments set monetary targets.

- The *Phillips curve*, showing an inverse relationship between inflation and unemployment, was introduced in Module 12 and discussed further in Module 16. Recall that the original Phillips curve suggested a trade-off, and hence a policy choice, between unemployment and inflation. However, following the apparent breakdown of the trade-off from the late 1960s onwards, economists developed more sophisticated variants of the Phillips curve.

- *Expectations-augmented Phillips curves* were introduced by monetarists, who believed that expectations of inflation played a strong role in determining actual inflation. These curves and the *accelerationist hypothesis*, also developed by monetarists, are outlined in this section. The terms 'expectations-augmented Phillips curves' and 'accelerationist hypothesis' are not used at this stage but the idea that people's expectations of inflation adapt to their experience of previous inflation is discussed, along with the consequences of this for inflation, output and employment. All of these issues will be discussed in more detail (with diagrams) in Sections 3 and 4 of this module.

- An important conclusion from the accelerationist hypothesis is that attempts to reduce unemployment below its natural rate by increasing aggregate demand will lead to ever-increasing inflation. This is consistent with the view that the long-run Phillips curve is vertical at the natural rate of unemployment and the long-run *AS* curve is vertical at the potential level of output.

- The natural (or equilibrium) rate of unemployment was discussed in Module 12. It consists of frictional, structural and seasonal unemployment and can be reduced by supply-side policies such as improved job information and retraining schemes.

- Since the technical detail of expectations-augmented Phillips curves and the accelerationist theory of inflation will be discussed in detail in Sections 3 and 4, some of the tasks suggested in the following checklist will be able to be answered more fully later.

1.3 Reading

Task	*√when completed*
Re-read Module 2, Sections 1.4 and 1.9.	☐
Read Chapter 16, pages 502–504 (up to the subsection on the new classical school).	☐

1.4 Checklist

Task	*√when completed*
Ensure that you can:	
• define the following key terms:	
– stagflation	☐
– natural rate of unemployment	☐
– adaptive expectations hypothesis	☐
– supply-side policies	☐
• outline the reasons for the rise of monetarism	☐
• explain how, according to monetarists:	
– an increase in the money supply causes ever-increasing inflation in the long run	☐
– an increase in the money supply might result in lower unemployment in the short run but not in the long run	☐
– a decrease in the money supply will reduce inflation without increasing unemployment in the long run	☐
• explain why monetarists suggest that the government should set targets for the rate of growth of the money supply	☐
• explain why, according to monetarists, the long-run Phillips curve is vertical	☐
• explain why, if the government wishes to reduce the natural level of unemployment, it should use supply-side policies to do so.	☐

1.5   Questions

Question

The vertical long-run Phillips curve suggests that:

A   an increase in aggregate demand increases output in the long run.
B   the economy will always operate at the natural rate of unemployment.
C   an increase in the money supply reduces frictional and structural unemployment.
D   people's expectations of inflation adapt to their experience of the past.

Solution

Option D.

Assuming the economy is operating at the natural level of unemployment, an increase in the money supply will increase aggregate demand and increase output, employment and prices in the short run. (Notice that employment expands *beyond its natural rate* and therefore Option B is incorrect.) Over time, workers and firms expect higher prices and wages (so Option D is correct) and these expectations are realised. As a result, higher (nominal) demand is absorbed in higher prices and real output falls back to its potential level of output (so Option A is incorrect) and unemployment rises to its natural rate in the long run.

Supply-side policies are necessary to reduce the natural rate of unemployment (so Option C is incorrect).

Note that a decrease in the rate of growth of the money supply will, in the long run, decrease inflation without increasing unemployment. There will be a temporary reduction in output and increase in unemployment, but the fall in prices will reduce expected inflation and, once price and wage inflation have adjusted to the new situation, unemployment falls to its natural rate, ie disequilibrium unemployment will be eliminated.

2   The new classical school

2.1   What's included in this section

- Key assumptions

- Monetary surprises

- Real business cycles

- Government policies

2.2   Guidance

As a guide to the reading, the following might be of help:

- This section provides an introduction to the views of the new classical school, which grew in influence in the 1970s and 1980s.

- New classical economists have great faith in markets – to the extent that they believe markets will clear continuously. Their other key assumption is that people form rational expectations based on current information. These are important assumptions.

- The implications of these assumptions are that the *AS* curve and the Phillips curve are vertical even in the short run. This means that measures to increase aggregate demand to increase output and reduce unemployment will be ineffective. The new classical view is that supply-side policies should be used to reduce the natural level of unemployment.

- Another cornerstone of the new classical theory is the real business cycle theory, which suggests that business cycles and long-term economic growth can be explained by supply-side shocks. Recall from Module 16 that we suggested writing a rough outline of business cycles encompassing the three sections of notes:

    – The description of the business cycle (Module 12, Section 1)

    – The Keynesian view (Module 16, Section 6)

    – The new classical view (this section).

- Monetary surprises and some of the detail on real business cycles are new to Subject CB2.

2.3   Reading

Task	*√when completed*
Re-read Module 2, Sections 1.4 and 1.10.	☐
Read Chapter 16, pages 504–506.	☐

2.4   Checklist

Task	√ when completed
Ensure that you can:	
• define the following key terms:	
– new classical school	☐
– continuous market clearing	☐
– rational expectations	☐
– policy ineffectiveness proposition	☐
– real business cycle theories	☐
• explain why, according to the new classical school, an anticipated change in aggregate demand will lead to a rise in prices but no increase in output or employment in the short run	☐
• explain why monetary surprises that could increase unemployment will not occur in the new classical model	☐
• explain the real business cycle theory, giving examples of supply-side shocks or impulses	☐
• give examples of monetarist and new classical policies introduced from the 1980s.	☐

2.5   Questions

Question

(i)   Distinguish between 'adaptive' expectations as used in the monetarist model of inflation and 'rational' expectations as used by the new classical economists.

(ii)   Describe the effect of each of these assumptions about expectations on the shape of the Phillips curve.

Solution

(i)   *Adaptive and rational expectations*

Adaptive expectations are based on past information. In the accelerationist model of inflation, developed by the monetarist school, the *expected* rate of inflation *this year* is the same as the *actual* inflation rate *last year*.

Rational expectations, assumed by the new classical school, are based on current information, including, for example, the current state of the economy and the policies being pursued by the government. Although information may be imperfect, any errors made in expectations will be random.

(ii)   *Implications for the Phillips curve*

If *adaptive* expectations are assumed, there is a short-run trade-off between inflation and unemployment but no long-run trade-off, *ie* the long-run Phillips curve is vertical.

For example, an increase in aggregate demand will increase inflation and reduce unemployment in the short run while wages lag behind the increase in prices. However, in the long run, expectations will adjust and wages will catch up with prices.

If *rational* expectations are assumed, the *short-run* Phillips curve is also vertical.

This is because an increase in aggregate demand will have been anticipated (monetary surprises are not allowed under these assumptions) and therefore will immediately cause people and firms to expect increases in wages and prices, so that there will be no increase in output or reduction in unemployment.

Question

Which of the following statements about the real business cycle theory is FALSE?

A   Real business cycle theories argue that the business cycle is principally created by movements in potential output.

B   Real business cycle theories focus on supply-side shocks or impulses.

C   Examples of supply-side shocks include increases in government spending.

D   Rational economic agents are assumed to respond to supply-side shocks by allocating their time in order to maximise lifetime utility, under conditions of continuous market clearing.

Solution

Option C.

An increase in government spending is a demand-side policy. Supply-side shocks include technological breakthroughs and the discovery of new sources of energy.

Real business cycle theory challenges the traditional distinction between the business cycle in the short term and the growth of potential output (economic growth) in the long term. It believes supply-side shocks affect both output in the short run and the economy's growth path.

3   The expectations-augmented Phillips curve and the inflation-unemployment relationship

3.1   What's included in this section

- The expectations-augmented Phillips curve (*EAPC*)

- How expectations are formed (adaptive and rational expectations)

- Short-run and long-run perspectives

3.2   Guidance

As a guide to the reading, the following might be of help:

- The expectations-augmented Phillips curve (developed by the monetarist economist, Milton Friedman) suggests that actual inflation is inversely related to unemployment (as the original version), but that it also depends on expectations of inflation and exogenous cost-push pressures.

- In this model, expectations of inflation are determined by past inflation rates, *ie* by *adaptive* expectations. However, new classical economists suggest that expectations are determined by the current state of the economy and current policies, *ie* by *rational* expectations.

- The way in which expectations are formed (adaptive or rational) and the speed with which markets clear (from slowly to continuously) determine the way in which an economy responds to an economic shock in the short run and in the long run.

3.3   Reading

Task	*√when completed*
Read Chapter 21, pages 646–648.	☐

3.4   Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– expectations-augmented Phillips curve	☐
– natural rate hypothesis	☐
• describe the expectations-augmented Phillips curve with reference to adaptive expectations	☐
• explain the implications of the assumptions regarding the formation of expectations and the speed of market clearing for the natural rate hypothesis.	☐

3.5   Questions

Question

The Phillips curve suggests that there is:

A   a positive relationship between unemployment and inflation.

B   a positive relationship between unemployment and expected inflation.

C   a negative relationship between exogenous cost pressures and inflation.

D   a negative relationship between unemployment and inflation.

Solution

Option D. The Phillips curve shows a trade-off between inflation and unemployment.

*Note that If a multiple-choice questions refers simply to the 'Phillips curve' without specifying the type of Phillips curve, then it is usually safest to assume the original and downward-sloping Phillips curve. To be precise, the original version of the Phillips curve showed a negative relationship between unemployment and **wage** inflation.*

Question

Describe the expectations-augmented Phillips curve and state its equation.

Solution

The expectations-augmented Phillips curve models actual price inflation (π) as a function of:

- the *inverse of the unemployment rate* (*U*), as higher aggregate demand leads to higher inflation and lower unemployment

- the *expected rate of inflation* (π^e), which is typically determined using adaptive expectations (*ie* it reflects past inflation rates)

- exogenous *cost-push inflation* (*k*) due to factors such as commodity price increases.

So its equation is:

$$\pi = f(1/U) + \pi^e + k$$

Question

Which of the following statements would NOT be used by new classical economists when criticising the monetarist view of adaptive expectations?

A   Trends are important when forming expectations.
B   The current situation and current policies are important when forming expectations.
C   Information is imperfect.
D   People are irrational.

Solution

Option D. New classical economists believe in *rational* expectations (so Option D is correct), *ie* people form the best view of the future from all of the available information on trends and forecasts (Options A and B) Although the information is imperfect because forecasts can be incorrect (Option C), new classical economists assume that the errors in prediction are random.

Question

According to the monetarist school, if an economy is operating at its natural rate of unemployment, an increase in aggregate demand will:

A   increase output in the short run and in the long run.
B   decrease unemployment in the short run and in the long run.
C   increase inflation in the short run but not in the long run.
D   decrease unemployment in the short run but not in the long run.

Solution

Option D.

In the short run, the economy will move along the expectations-augmented Phillips curve towards the left, thus reducing unemployment below its natural level (and increasing output beyond its potential level) and increasing the rate of inflation.

In the long run, expectations of inflation increase and this shifts the expectations-augmented Phillips curve upwards. According to the natural rate hypothesis, revealed in the vertical long-run Phillips curve, unemployment will return to its natural rate in the long run (and output to its potential level), but with a higher rate of inflation.

So, to address the options specifically:

- output will increase in the short run but not in the long run (so Option A is incorrect)

- unemployment will decrease in the short run but not in the long run (so Option B is incorrect and Option D is correct)

- inflation will increase in the short run and in the long run (so Option C is incorrect).

Question

In an economy that is operating at the natural rate of unemployment, which of the following factors influence the speed with which an increase in aggregate demand leads to an increase in inflation?

I   the extent of demand-deficient unemployment in the economy
II   the way in which expectations are formed
III   the flexibility of wages and prices

A   I only
B   I and II only
C   II and III only
D   I, II and III

Solution

Option C. Assuming the economy is operating at the natural rate of unemployment, there is no demand-deficient unemployment. New classical economists assume that people form rational expectations and that goods and labour markets clear continuously because of flexible wages and prices. As a consequence, they believe that an increase in aggregate demand will have no impact on the level of output or employment, even in the short run, and that prices will increase very quickly.

4   Inflation and unemployment: the monetarist perspective

4.1   What's included in this section

- The short-run trade-off

- The accelerationist hypothesis

- Stagflation and Phillips loops

- Phillips loops and the political business cycle

- Policy implications

4.2   Guidance

As a guide to the reading, the following might be of help:

- This section of the module fills in the detail of the accelerationist hypothesis of inflation that was outlined in Section 1. It is worth noting that this theory has been examined regularly in previous exam papers. The theory:

    - assumes adaptive expectations and therefore allows a short-run trade-off between unemployment and inflation

    - suggests that unemployment can be reduced below its natural rate only at the cost of accelerating inflation (details of the process in Box 21.2 on page 651)

    - concludes that the long-run Phillips curve is vertical at the natural rate of unemployment.

- The monetarist model can be used to explain stagflation, in terms of either clockwise Phillips loops or rightward shifts in the long-run Phillips curve. The model can also be used to explain how unemployment and inflation vary across the political cycle. Since government action designed for political gain can be destabilising, monetarists recommend that governments adopt policy rules and targets, such as the UK's inflation target of 2%.

- The policy implications of the monetarist school are reiterated:

    - An important consequence of a vertical long-run Phillips curve is that although demand-side (fiscal and monetary) policies will affect inflation, they will have no long-run effect on unemployment.

    - Monetarists support the use of supply-side policies to reduce the natural rate of unemployment and hence shift the vertical Phillips curve to the left.

- The material on Phillips curve loops and the political business cycle is new to Subject CB2.

4.3   Reading

Task	√when completed
Read Chapter 21, pages 649–652.	☐

4.4   Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– accelerationist hypothesis	☐
– political business cycle	☐
• describe the short-run and long-run effects of both expansionary and contractionary policy within the context of the accelerationist hypothesis	☐
• outline the implications of the accelerationist hypothesis for the long-run Phillips curve	☐
• explain two possible causes of stagflation	☐
• describe the way in which the monetarist adaptive expectations model illustrates the political business cycle	☐
• outline the implications of the monetarist model for economic policy (ie demand-side policy, supply-side policy and the use of rules and targets).	☐

4.5   Questions

Question

According to the accelerationist hypothesis of inflation, a decrease in aggregate demand will, in the short run, cause:

A   a rightward movement along the expectations-augmented Phillips curve.

B   a leftward movement along the expectations-augmented Phillips curve.

C   an upward shift of the expectations-augmented Phillips curve.

D   a downward shift of the expectations-augmented Phillips curve.

Solution

Option A. According to the accelerationist hypothesis of inflation, a decrease in aggregate demand will, in the short run, increase unemployment and reduce the rate of inflation, so there will be a movement *along* the expectations-augmented Phillips curve towards the right.

Note that in the long run, expectations of inflation decrease and this shifts the expectations-augmented Phillips curve downwards. Workers are now prepared to accept lower wages and unemployment falls to its natural rate.

Question

Describe a situation of stagflation and examine possible causes of stagflation.

Solution

Stagflation is a situation in which there is a simultaneous rise in unemployment and inflation. This situation occurred in many countries in the 1970s.

Possible causes include:

- an increase in structural or frictional unemployment at the same time as an increase in cost-push inflationary pressures, since both will cause a rightward or upwards shift of the Phillips curve

- an increase in structural or frictional unemployment at the same time as an increase in aggregate demand, since an increase in aggregate demand will not reduce these forms of unemployment and will add to inflationary pressures *(assuming that the increase in structural and frictional unemployment exceeds the fall in demand-deficient unemployment)*

- changes in government policy as different objectives are prioritised. For example, if government policy to reduce unemployment by increasing aggregate demand is reversed because it has caused inflation, unemployment will rise but inflation might continue to rise as expectations of inflation have been fuelled.

Question

Using expectations-augmented Phillips curves, illustrate and explain the political business cycle.

Solution

The *political business cycle* theory suggests that the pattern of unemployment and inflation can be fitted to the electoral cycle because government policy is designed to increase the probability of re-election.

The following diagram illustrates clockwise Phillips loops.
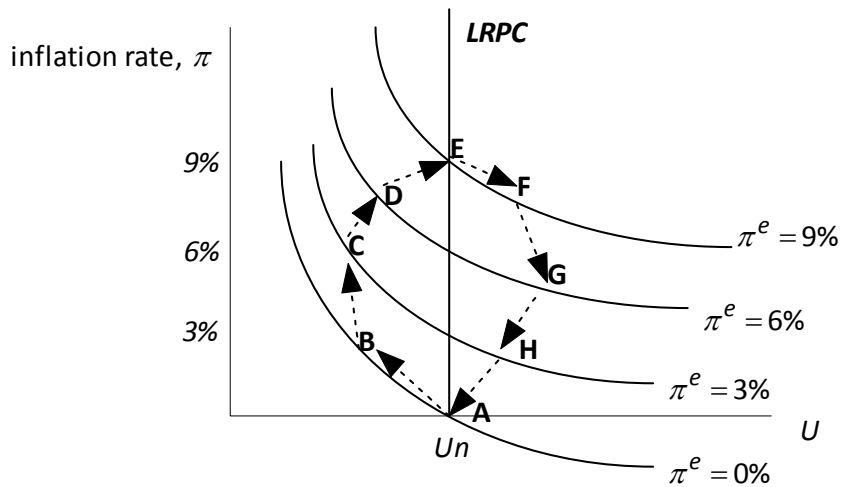
Suppose a new government starts at position A. It has promised to reduce unemployment so it expands aggregate demand and moves from A to B to C. However, over time, inflationary expectations increase and inflation takes hold. Contractionary policy initially has little success in bringing down inflation (because of high expected inflation) but increases unemployment. The economy therefore moves from C to D to E. Rising unemployment and inflation (stagflation) is not a situation that is likely to earn the government re-election.

If a new government comes in, it will prioritise inflation and continue the contractionary policy. This will increase unemployment, which will not be popular, but will reduce inflationary expectations, *ie* take the economy from E to F to G. As the next election draws near, the government will undertake a pre-election boom to increase its popularity. Unemployment will fall and inflation will fall too as inflationary expectations adjust downwards, *ie* the economy moves from G to H to A.

Question

Which of the following should form part of economic policy for monetarists?

I   expansionary fiscal and monetary policy
II   supply-side policy
III   targets for the growth of the money supply and inflation

A   I only
B   I and II only
C   II and III only
D   I, II and III

Solution

Option C.

Monetarists believe that an increase in aggregate demand by *expansionary fiscal and monetary policies* (Statement I) will not have a long-term effect on output and employment and will only achieve an increase in the rate of inflation. If the economy is suffering from a recession, monetarists suggest that this will be temporary and no government action is required, because market forces will ensure that the economy returns to its natural level of output and employment in the long run.

If the natural rate of unemployment is deemed too high, *supply-side policies* (Statement II) should be used to reduce it.

To control the rate of inflation, the government should set *targets* for both the rate of inflation, *eg* 2%, and for the growth of the money supply (Statement III), which is the main determinant of inflation.

5   The Keynesian response

5.1   What's included in this section

- Market imperfections

- Hysteresis

- Government intervention

5.2   Guidance

As a guide to the reading, the following might be of help:

- Monetarists and new classical economists dominated economic thinking in the 1970s and 1980s, but the followers of Keynes were unhappy with many of the assumptions of their models (particularly with the new classical view of continuous market clearing) and with many of the policy prescriptions that result from these.

- Keynesians, particularly a group known as *new Keynesians*, highlight the problem of market imperfections such as price and wage rigidity. If markets do not clear (or do not clear quickly), fluctuations in output and employment will occur. Some of the detail on this issue is new to Subject CB2.

- In Module 16, Section 2, we discussed Keynes' criticisms of the classical view of the labour market. Keynesians resume this argument with the *new* classical economists. They believe that if aggregate demand falls, a recession could occur, as output falls and unemployment rises. Recessions may seriously harm the economy and decrease its long-term potential output.

- Keynesians believe therefore that government intervention is required both to deal with shocks to the economy (such as the financial crisis in 2008) and to maintain an environment that is conducive to investment and growth.

5.3   Reading

Task	√*when completed*
Re-read Module 2, Sections 1.4 and 1.8.	☐
Read Chapter 16, pages 506–510.	☐

5.4   Checklist

Task	√ *when completed*
Ensure that you can:	
• define the following key terms:	
− new Keynesians	☐
− efficiency wage hypothesis	☐
− insiders and outsiders	☐
− hysteresis	☐
− non-accelerating inflation rate of unemployment (NAIRU)	☐
• draw a diagram to show the effect of menu costs on a monopolistically competitive firm faced with a decrease in demand	☐
• explain the implications of price rigidity for the new classical view that real output is not affected by changes in aggregate demand	☐
• describe six sources of market imperfections	☐
• explain why hysteresis might cause the natural or NAIRU rate of unemployment to increase	☐
• describe the Keynesian view of demand-management policies.	☐

5.5   Questions

Question

Explain the reasons why real wages might remain above the equilibrium rates in a recession.

Solution

In a recession, the demand for labour falls and if markets are flexible, real wages will fall. Real wages depend on nominal wages and the price level. Real wages will fall if nominal wages fall or if nominal wages rise by less than the rate of inflation.

Nominal wages are unlikely to fall in a recession because:

* wages are often fixed for a period of time by a contract

* workers resist a wage cut (by their own displeasure, the threat of looking for work elsewhere, or by union action)

* a cut in working hours or the non-replacement of workers who leave might be preferred by workers and/or employers

* if workers are on zero-hours contracts, employers can easily cut hours rather than wage rates.

It might seem easier to achieve a real wage cut (than a nominal wage cut) but even real wages might not fall in a recession because:

- firms are reluctant to reduce real wages for fear of reducing morale and productivity (*efficiency wage hypothesis*)

- the employed (the insiders) have power (from their union, close relationship with the employer, and/or their skills) to prevent the unemployed (the outsiders) competing down real wages (*insider-outsider theory*).

Question

Which of the following explain hysteresis?

I   loss of skills and confidence
II   recession
III   continuous market clearing

A   I only
B   I and II only
C   II and III only
D   I, II and III

Solution

Option B. *Hysteresis* is the persistence of unemployment even when the deficiency of demand that caused it no longer exists. A recession (Statement II) can lead to a long period of unemployment during which workers lose skills and confidence (Statement I). When the recovery comes, these workers might be unable to take up new jobs, so unemployment remains high. If there was continuous market clearing (Statement III), a decrease in the demand for labour would lead to a fall in wages to clear the labour market.

Question

Explain the effect of each of the following on the Phillips curve:

(i)   expectations of inflation

(ii)   structural unemployment

(iii)   hysteresis

(iv)   inflation targeting.

Solution

(i)   *Expectations of inflation*

Increased expectations of inflation will move the Phillips curve upwards, such that a given level of unemployment is associated with a higher rate of inflation.

(ii)   *Structural unemployment*

Structural unemployment is not caused by demand factors but by a change in the pattern of demand or supply in particular industries. So an increase in structural unemployment will shift the Phillips curve to the right, *ie* a given rate of inflation is associated with a higher rate of unemployment.

(iii)   *Hysteresis*

If the economy suffers from hysteresis, *ie* an inability of employment to recover fully from a recession because of lost capacity, then the Phillips curve shifts to the right and the non-accelerating-inflation rate of unemployment (NAIRU) increases.

This means that when the economy begins to recover, output cannot rise very far because of the shortage of capacity, so prices rise (even though unemployment is still high).

(iv)   *Inflation targeting*

Inflation targeting reduces expectations of inflation and, if the target is achieved regardless of the level of unemployment, the Phillips curve becomes a horizontal line at the target rate of inflation.

Question

Define hysteresis and explain why it implies that the long-run aggregate supply is not vertical.

Solution

Hysteresis is the persistence of unemployment even the when the deficiency of aggregate demand that caused it no longer exists.

Keynesians argue that a rise in unemployment caused by a reduction in aggregate demand cannot simply be reversed by an increase in aggregate demand, because the recession itself causes higher unemployment to become embedded in the economy.

A recession causes the long-term unemployed to lose their skills and motivation, *ie* their human capital, so that they become less productive and hence less employable. Employers also become more cautious about taking on workers. Workers who remain employed (insiders) may also prevent real wages falling and therefore prevent the unemployed (outsiders) from competing real wages down and becoming employed.

Hence the labour market (and the economy as a whole) is in equilibrium with less labour being employed and less output being produced, *ie* the natural rate of employment and the potential level of output both fall.

This corresponds to a reduction in long-run aggregate supply, so, according to Keynesians, the long-run aggregate supply (*LRAS*) curve is not vertical. If the price level remains constant, the *LRAS* curve would be horizontal at the price level, but if the price level falls too, the *LRAS* curve would slope upwards.

The practice questions start on the next page so that you can
keep the practice questions and solutions together for revision purposes.

Module 17 Practice Questions

17.1   According to the principle of the 'neutrality of money':

Exam style

A   changes in the money supply will only affect nominal variables.

B   an increase in the money supply will increase real output.

C   a decrease in the money supply will reduce real wages.

D   there should be no increase in the money supply.   [1½]

17.2   Which of the following methods for increasing national income might a monetarist or new classical economist recommend?

Exam style

A   increase government spending

B   decrease interest rates

C   encourage firms to increase their productivity

D   reduce the exchange rate of the domestic economy to encourage exports   [1½]

17.3   Which of the following is NOT a feature of the new classical model of the economy?

Exam style

A   rational expectations

B   hysteresis

C   continuous market clearing

D   policy ineffectiveness proposition   [1½]

17.4   If the actual rate of unemployment is lower than the natural rate of unemployment because the government has increased the rate of growth of the money supply, then, according to the accelerationist hypothesis:

Exam style

A   the expectations-augmented Phillips curve shifts downwards.

B   the expectations-augmented Phillips curve shifts upwards.

C   the long-run Phillips curve shifts to the left.

D   the long-run Phillips curve shifts to the right.   [1½]

17.5   According to the accelerationist hypothesis, which of the following statements is correct?

Exam style

A   If inflation is temporarily above its expected level, then unemployment will be below its natural level.

B   If inflation is temporarily below its expected level, then unemployment will be below its natural level.

C   If inflation is temporarily above its expected level, then unemployment will be above its natural level.

D   If inflation is temporarily below its expected level, then unemployment will rise.   [1½]

17.6 Which of the following statements is FALSE?

Exam style

A   A consequence of the long-run Phillips curve is that macroeconomic policy has no long-run effect on unemployment.

B   Stagflation refers to a situation in which both inflation and unemployment are increasing.

C   Adaptive expectations means people will consistently underestimate inflation if it is rising.

D   Successful inflation targeting will result in a Phillips curve that is broadly horizontal.   [1½]

17.7   (i)   Draw a diagram to illustrate the original Phillips curve.   [1]

Exam style

         (ii)   Using expectations-augmented Phillips curves, illustrate the effects on the rate of unemployment of a government cutting the rate of growth of the money supply in order to reduce inflation:

                (a)   in the short run

                (b)   in the long run.   [5]
                                                                                        [Total 6]

17.8   The following diagram shows the possible effects on a firm in monopolistic competition of a decrease in demand for a product as a result of a decrease in aggregate demand, assuming constant average cost.

Exam style
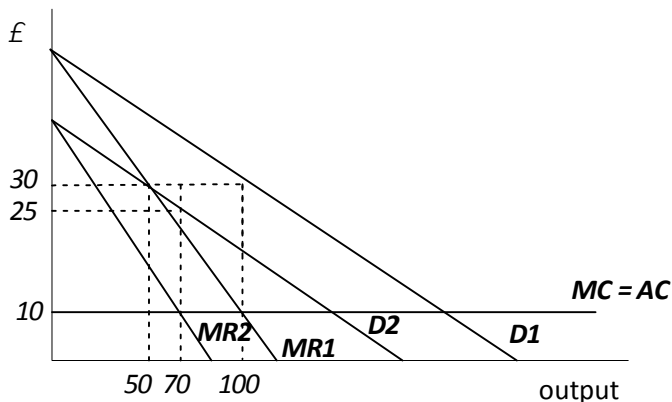
Assuming menu costs arising from a price change are estimated at a quarter of current supernormal profit, the consequences of a fall in demand from *D1* to *D2* are:

A   a fall in price from £30 to £25 and a fall in output from 100 to 70.

B   a fall in price from £30 to £25 and a fall in output from 100 to 50.

C   an unchanged price at £30 and a fall in output from 100 to 70.

D   an unchanged price at £30 and a fall in output from 100 to 50.   [1½]

17.9   Which of the following is NOT associated with Keynesian economics?

Exam style

A   slow adjustment in the labour market

B   the multiplier

C   real business cycle theory

D   efficiency wage hypothesis   [1½]

![ABC icon]

Module 17 Solutions

17.1   Option A. According to principle of the *neutrality of money*, changes in the money supply affect only nominal variables and have no effect on real variables. This means that prices will be affected, and through prices, nominal wages, nominal consumption and nominal output will be affected. However, the real value of these variables will not be affected.

Monetarists argue that this holds in the long run, whereas new classical economists argue that it holds in the short run too.   [1½]

17.2   Option C. Options A, B and D lead to increases to aggregate demand, which monetarist and new classical economists believe would not increase output but would only increase inflation. In order to achieve an increase in output, monetarist and new classical economists propose supply-side policies, such as measures to increase the productivity of private firms.   [1½]

17.3   Option B.

Hysteresis is the failure of employment to bounce back after a shock, *eg* after a recession. Keynesian economists believe that a recession does long-term harm to the economy and so the economy will not easily recover. For example, unemployed workers lose skills and confidence and might not easily be able to obtain work when the economy begins to recover.

Conversely, new classical economists believe that market forces work well, as a result of rational expectations (Option A) and continuous market clearing (Option C), so that the economy will quickly be restored to its potential output. Since new classical economists believe that the short-run and the long-run *AS* curves are vertical at the potential output level, they believe that a policy to increase aggregate demand will not achieve an increase in output, *ie* this policy would be ineffective (Option D).   [1½]

17.4   Option B. The following diagram shows the effect of an increase in the rate of growth of the money supply on the expectations-augmented Phillips curves.
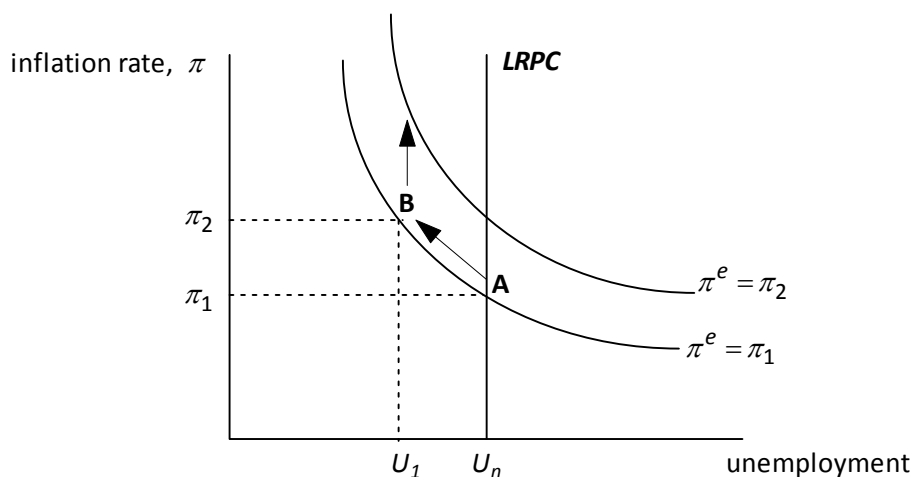
If the economy is initially at Point A, then an increase in the rate of growth of the money supply moves the economy along the current expectations-augmented Phillips curve to Point B (as interest rates decrease and aggregate demand, GDP and employment increase).

Here the actual rate of unemployment is lower than the natural rate of unemployment and the actual rate of inflation π_2 is above the expected rate of inflation π_1. People will therefore revise their expectations of inflation upwards and the expectations-augmented Phillips curve shifts upwards to the curve labelled $\pi^e = \pi_2$. [1½]

17.5   Option A. Expectations-augmented Phillips curves intersect with the long-run Phillips curve when the actual inflation rate is equal to the expected inflation rate. (See diagram above in Question 17.4.) If the actual rate of inflation *exceeds* the expected rate, the economy has experienced an expansion of aggregate demand and hence a reduction in unemployment to below its natural level. This corresponds to the economy being in a position on an expectations-augmented Phillips curve to the *left* of the vertical long-run Phillips curve. [1½]

17.6   Option A. A consequence of the long-run Phillips curve is that *demand-side* macroeconomic policy (*ie* using fiscal and monetary policy to directly influence aggregate demand) has no long-run effect on unemployment. This is because according to the accelerationist hypothesis, unemployment will always revert to its natural rate, consistent with the long-run Phillips curve. However, *supply-side* policies, which aim to increase aggregate supply (*ie* total output), may reduce frictional and structural unemployment, which causes a leftward shift in the long-run Phillips curve, and hence a long-run reduction of unemployment. [1½]

17.7   (i)   ***The original Phillips curve***
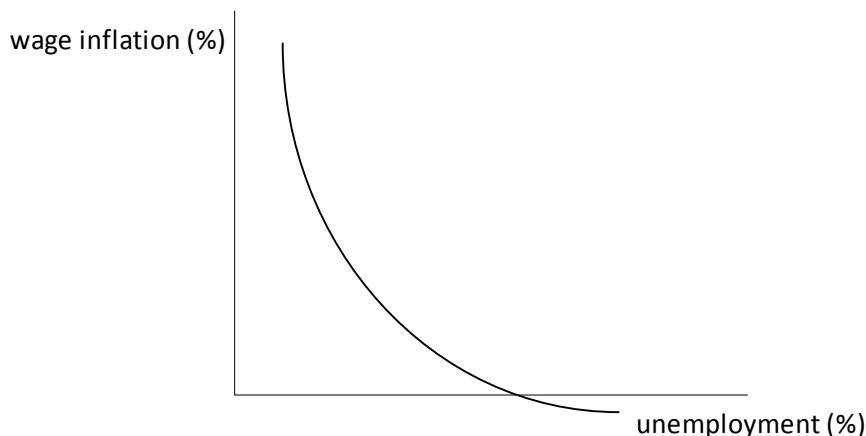
[1 for diagram]

*Notice that the **original** Phillips curve, covered in Module 12, showed the relationship between **wage** inflation and unemployment.*

(ii)(a)   *Short-run effects of a decrease in the money supply*
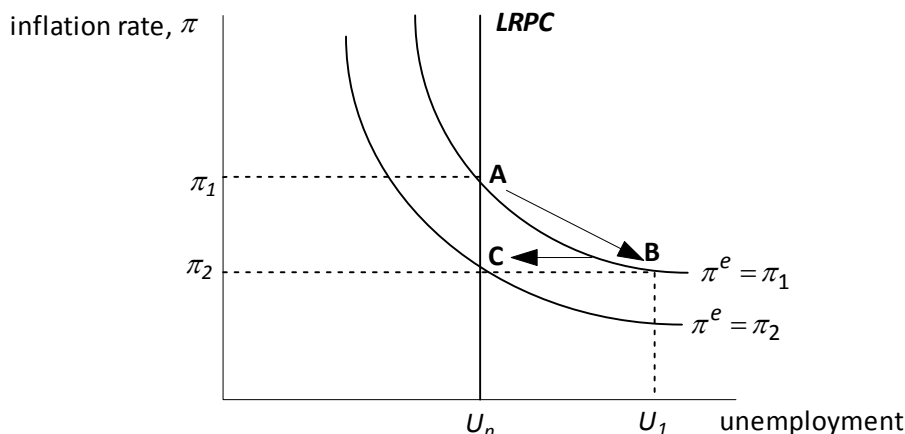
[1 for diagram]

Initially the economy is at Point A with inflation rate π_1. The government decreases the rate of growth of the money supply in an attempt to decrease the rate of inflation to π_2. In the short run, we might expect the decrease in aggregate demand to cause prices and wages to fall.   [½]

However, workers may not believe that the government's actions will reduce inflation, *ie* they will continue to expect inflation rate π_1 and will continue to ask for pay rises corresponding to π_1. [½]

These pay rises will represent an increase in real costs for firms, who will respond by cutting output and laying off workers.   [½]

In the short run, therefore, the economy will move from Point A to Point B. So, unemployment increases to U_1 and the rate of inflation falls to π_2.   [½]

(ii)(b)   *Long-run effects of a decrease in the money supply*

In the long run, however, workers accept that inflation is falling …   [½]

… and eventually, they will be prepared to settle for wage increases at the government's desired rate of inflation (π_2).   [½]

The expectations-augmented Phillips curve will shift downwards …   [½]

… and the economy will settle at Point C, which is on the long-run Phillips curve at the desired rate of inflation.   [½]

[Total 5]

17.8   Option D.

The initial profit-maximising position is where $MC = MR1$, *ie* at output 100 and price £30. Supernormal profit is currently $(30-10)\times100=£2,000$. If the demand falls to $D2$, then ignoring menu costs, the new profit-maximising position is where $MC = MR2$, *ie* at a lower output 70, a lower price £25 and a lower supernormal profit of $(25-10)\times70=£1,050$.

Menu costs are the costs incurred in changing price lists and negotiating new prices with customers and suppliers. In this case, these are substantial at a quarter of £2,000, *ie* £500, and therefore could make the firm reluctant to change prices. In fact, if menu costs are allowed for, the supernormal profit becomes $£1,050 - £500 = £550$.

However, if the firm keeps the price at £30 and allows output to fall to 50, supernormal profit would be higher at $(30 - 10) \times 50 = £1,000$, as there would be no menu costs.

So, in this case, the firm would choose to keep the price at £30 and allow output to fall to 50. This shows that changes in aggregate demand can have significant effects on real GDP (output) when there are price rigidities.   [1½]

17.9   Option C.

The real business cycle theory is associated with the new classical school. It states that supply-side shocks or impulses are responsible for fluctuations in output and have a permanent effect on long-term economic growth. Keynesians, on the other hand, believe that changes in aggregate demand explain cyclical fluctuations in output and, although they agree that supply-side factors affect long-run growth, they think that governments should manage aggregate demand to maintain an environment that encourages investment and growth.

The multiplier (Option B) is a key element of Keynes' theory of the determination of national income. Keynesians believe that market imperfections, such as that explained by the efficiency wage hypothesis (Option D), prevent the labour markets clearing quickly (Option A), if at all.   [1½]

18

Relationship between the goods and money markets

Syllabus objectives

3.7   Discuss the role of money and interest rates in the economy.

    7.   Describe how a change in the money supply and/or interest rates affects the level of business activity.

3.9   Discuss what determines the level of business activity and how it affects unemployment and inflation.

    3.   Describe the effect of a rise in the money supply on output and prices.

Core Reading

Chapter 19 (Sections 1, 2, 3 and Appendix)   *Pages 588–610, 615–620*

0   Introduction

In previous modules we have discussed:

*   the determination of the equilibrium national income (Module 16)

*   the determination of the equilibrium interest rate (Module 15).

The first of these is a model of the goods market and the second a model of the money market. So far, as part of these distinct models, we have considered the interaction between the two markets by examining the effect of:

*   a change in the money supply on the equilibrium national income

*   a change in income on the equilibrium interest rate.

In Sections 1 and 2, using theory that we have already studied, we examine the interaction between the two markets in more detail.

In Section 3, we study the *IS-LM* model. This model was developed in the 1950s by John Hicks, a member of the group of economists known as neo-Keynesians, which attempted to synthesise Keynes' work with neoclassical models. This model shows the simultaneous determination of equilibrium in the goods market and the money market, *ie* equilibrium national income and the equilibrium interest rate.

In Section 4, we look at the *IS-MP* model. This is a development of the *IS-LM* model, which recognises that in the modern world, many central banks do not operate monetary policy through the direct control of the money supply; instead, they influence interest rates in order to achieve a target rate of inflation.

Sections 1 and 2 are covered in slightly more detail in Subject CB2 than previously. The *IS-LM* and *IS-MP* models are new to CB2, though the *IS-LM* model was studied in the pre-2010 CT7 syllabus.

1 The effects of monetary changes on national income

1.1 What's included in this section

- The quantity theory of money

- The interest rate transmission mechanism

- The exchange rate transmission mechanism

- The portfolio balance effect

- The stability of the velocity of circulation

1.2 Guidance

As a guide to the reading, the following might be of help:

- We have already met the quantity theory of money a couple of times. Here we look at it in more detail. We consider the transmission mechanisms by which a change in the money supply affects output and prices, and we also question the assumptions of the quantity theory.

- Figure 19.1 (on the transmission mechanisms through which a change in the money supply affects output and prices) is very important. It could form the basis of an answer to a 10-mark question. There are two transmission mechanisms (through interest rates and through the exchange rate) and the strengths of most of the links in the chain are discussed in this module.

- This module uses the injections-withdrawals diagram of the goods market, and the money supply and demand diagram of the money market, both of which we met in earlier modules (Module 16 and Module 15 respectively). It also uses a diagram that we haven't met before to show the relationship between investment and the interest rate. These diagrams are first used in Figure 19.2.

- We have discussed the final link (*ie* the aggregate demand - output and/or prices link) in previous modules (Modules 16 and 17). Basically, whether an increase in aggregate demand leads to an increase in real output or prices depends on the elasticity of aggregate supply, *ie* on the shape of the *AS* curve. If real output is fixed, *ie* the *AS* curve is vertical, then the price level will increase; but if there is excess capacity, *ie* the *AS* curve slopes upwards, real output can increase and the price level might not increase.

- Some of the detail in this section, especially the use of diagrams, is new to Subject CB2.

1.3 Reading

Task	√when completed
Read *Chapter 19*, pages 588–600.	☐

1.4   Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– interest rate transmission mechanism	☐
– exchange rate transmission mechanism	☐
– liquidity trap	☐
– portfolio balance	☐
• explain the difference between the realised (*ex post*) real rate of interest and the perceived (*ex ante*) real rate of interest	☐
• describe and draw diagrams to illustrate the interest rate transmission mechanism	☐
• describe the circumstances in which an increase in the money supply will have a relatively large effect on national income	☐
• analyse the problems with the interest rate transmission mechanism at:	
– Stage 1: the money supply - interest rate link	☐
– Stage 2: the interest rate - investment link	☐
– Stage 3: the investment - national income link	☐
• describe and draw diagrams to illustrate the exchange rate transmission mechanism	☐
• analyse the strength of the exchange rate transmission mechanism at:	
– Stage 1: the money supply - interest rate link	☐
– Stage 2: the interest rate - exchange rate link	☐
– Stage 3: the exchange rate - net exports link	☐
– Stage 4: the net exports - national income link	☐
• explain the way in which a change in the money supply affects portfolio balance and hence has an impact on aggregate demand	☐
• discuss the stability of the velocity of circulation in the short run and in the long run	☐
• describe the attitude of monetarist and Keynesian economists towards the use of the money supply to influence the economy.	☐

1.5   Questions

Question

Choose the appropriate underlined words in the following passage.

An increase in the money supply will have a greater impact on the price level …

(i)   … the more elastic/inelastic the demand for money …

(ii)   … the more elastic/inelastic the demand for investment …

(iii & iv) … the greater/smaller the depreciation/appreciation of the currency …

(v)   … the more elastic/inelastic the demand for exports and imports

(vi)   … the more elastic/inelastic the aggregate supply curve.

Solution

(i)   inelastic

(ii)   elastic

(iii)   greater

(iv)   depreciation

(v)   elastic

(vi)   inelastic

Question

A liquidity trap occurs when:

A   an increase in government borrowing diverts funds from the private sector.
B   there is too much money in circulation.
C   interest rates are at their floor so that any additional money will be held as idle balances.
D   interest rates are so low that people do not wish to borrow.

Solution

Option C. When interest rates fall (and bond prices rise), the speculative (or idle) demand for money will increase (*ie* there is a movement along the demand for money curve) as the opportunity cost of holding savings in money falls. People think it's not worth buying bonds; they might as well hold their savings in money form. When interest rates are at their floor, people expect interest rates to rise and bond prices to fall, so no-one wants to buy bonds and any additional money is held. Note that Option A is the definition of financial crowding out.

Question

According to the portfolio balance theory, which of the following statements in FALSE?

A   People hold wealth in a portfolio of assets.
B   An increase in the money supply means that portfolios are too liquid.
C   People will spend excess liquid balances on financial assets and goods and services.
D   An increase in the money supply will decrease aggregate demand.

Solution

Option D. The first three explain the logic of the theory. People hold wealth in a portfolio of assets including money, financial assets (*eg* bonds, shares) and physical assets (*eg* property, cars). An increase in the money supply means that people might find that their portfolios are too liquid. As a result, people will spend excess liquid balances on both financial assets and goods and services. This increase in consumption therefore *increases* aggregate demand.

Question

Which of the following statements about the velocity of circulation is TRUE?

A   In the short run, the demand for money is stable and hence the velocity of circulation is stable.

B   An increase in the money supply reduces interest rates and therefore causes an increase in the amount of speculative money held and hence a fall in the velocity of circulation.

C   The financial crisis of 2008 contributed to a rise in the velocity of circulation.

D   According to monetarists, the velocity of circulation is unstable and therefore targets for the growth of the money supply should be used in the long run.

Solution

Option B.

The fall in interest rates as a result of a rise in the money supply will cause a movement downwards along the demand for money curve and result in higher holdings of money. This is because the fall in interest rates reduces the attraction of holding bonds *etc*. Higher holdings of speculative (or idle) money result in a lower velocity of circulation.

Let's consider why the other options are false:

- Option A: In the short run, the demand for money is *unstable* and unpredictable (*eg* changing because of changing expectations of price changes) and hence the velocity of circulation is unstable.

- Option C: The financial crisis caused people to increase their holdings of money and hence contributed to a *fall* in the velocity of circulation.

- Option D: Monetarists recommend a long-term approach to monetary policy using targets for the growth of the money supply because they believe that, in the long run, the velocity of circulation is *stable and predictable*, and therefore the effect of a change in the money supply on aggregate demand and national income is predictable.

2 The monetary effects of changes in the goods market

2.1 What's included in this section

- The monetary effects of an increase in injections

- Crowding out

- The extent to which the money supply is exogenous

2.2 Guidance

As a guide to the reading, the following might be of help:

- This section examines the effect of an increase in injections on the money market. The link here is the effect of an increase in injections (and hence national income) on the demand for money and hence interest rates. If interest rates increase, this might cause a reduction in investment and consumption that 'crowds out' the effect of the initial injection.

- Crowding out was an argument used by classical economists to explain their reluctance to expand public spending in the 1930s. It is still an important issue that divides the Keynesian from the monetarist and new classical schools. Keynesians believe that little or no crowding out takes place, while the latter two schools believe that crowding out will be substantial.

- Some of the detail and diagrams on this topic are new to Subject CB2.

2.3 Reading

Task	√when completed
Read Chapter 19, pages 600–603.	☐

2.4   Checklist

Task	√when completed
Ensure that you can:	
• define the following key term:	
– financial crowding out	☐
• explain and draw diagrams to illustrate the effect of an increase in injections on national income if:	
– the money supply is fixed	☐
– the central bank allows the money supply to increases in response to the increase in the demand for money	☐
• describe the effect on the money supply and hence on national income of an increase in government spending (resulting in a budget deficit) if the government borrows:	
– from the non-bank private sector	☐
– from the central bank or by selling Treasury bills to the commercial banks	☐
• explain the following determinants of the extent of crowding out:	
– the interest-elasticity of the demand for money	☐
– the interest-elasticity of the demand for investment	☐
– the interest-elasticity of the supply of money (the extent to which the supply of money is endogenous)	☐
• describe the views on crowding out of:	
– the Keynesian school	☐
– the monetarist and new classical schools	☐
• describe the two opposing views on fiscal expansion and the dangers of crowding out in the early 2010s	☐
• discuss the implications of an endogenous money supply for monetary policy.	☐

2.5 Questions

Question

Following an expansionary fiscal policy to boost national income, a government can avoid crowding out by:

A   altering the multiplier.

B   reducing private sector investment.

C   imposing price controls.

D   increasing the money supply.

Solution

Option D. Increasing government expenditure increases aggregate demand and increases national income. The resulting increase in demand for active money increases interest rates if we assume the supply of money curve is fixed. Higher interest rates reduce consumption and investment and possibly net exports, hence crowding out some of the initial increase in aggregate demand. However, increasing the money supply puts an offsetting downward pressure on interest rates so that consumption and investment will not fall.

Question

Keynesian economists believe that crowding out following a rise in injections is likely to be small because:

A   the demand for money is interest-elastic, money supply is interest-elastic and private investment is interest-inelastic.

B   the demand for money is interest-inelastic, money supply is interest-inelastic and private investment is interest-inelastic.

C   the demand for money is interest-elastic, money supply is interest-elastic and private investment is interest-elastic.

D   the demand for money is interest-inelastic, money supply is interest-inelastic and private investment is interest-elastic.

Solution

Option A. A rise in injections will lead to an increase in national income and hence an increase in the demand for money. If the demand for money and supply of money are both elastic, *ie* the two curves are relatively flat, then the resulting increase in interest rates will be relatively small. If the demand for investment is interest-inelastic, the demand for investment will not fall very much in response to the slightly higher interest rates.

Question

Choose the appropriate words in each of the following sentences:

(i)   According to extreme monetarist economists, the supply of money is completely <u>exogenous/endogenous</u>.

(ii)   According to extreme <u>Keynesian/new classical</u> economists, the supply of money passively responds to changes in aggregate demand and hence the demand for money.

(iii)   If the supply of money is partly endogenous, it makes it <u>easier/more difficult</u> for the authorities to influence money supply.

(iv)   Rather than try to control the supply of money directly, many central banks aim to influence the supply of money indirectly by controlling <u>interest rates/exchange rates</u> …

(v)   … and hence the <u>demand for/supply of</u> money.

Solution

(i)   exogenous

(ii)   Keynesian

(iii)   more difficult

(iv)   interest rates

(v)   demand for

3   The *IS-LM* model

3.1   What's included in this section

- The goods and money markets

- The *IS* curve

- The *LM* curve

- Equilibrium

- The full effects of changes in the goods and money markets

3.2   Guidance

As a guide to the reading, the following might be of help:

- The *IS-LM* model is an amalgamation of Keynes' theory of the goods market (the theory of income determination) along with his theory of the money market (the theory of interest rate determination). As such it allows us to examine the effect of changes in the goods market and the money market on both national income and interest rates.

- The model has the following key features:
  - the *IS* curve shows the combinations of real national income and real interest rates at which there is equilibrium in the goods market (*IS* stands for investment = savings in the simple Keynesian model)
  - the *LM* curve shows the combinations of real national income and real interest rates at which there is equilibrium in the money market (*LM* stands for liquidity preference (or demand for money) = the supply of money)
  - both markets are in equilibrium where the curves intersect
  - the model assumes constant prices, *ie* there is no inflation, so the *nominal* interest rate and national income are the same as the *real* interest rate and national income.

- Interestingly and usefully, by varying the slopes of the *IS* and *LM* curves, the model allows a comparison of the views of Keynesians and monetarists.

- A later model (the *IS-MP* model) will be studied in the following section of this module. However, the *IS* curve is common to both and the derivation of the *IS* curve is explained within the section on this model on pages 604-605.

- It might therefore be sensible to tackle the material in the following order:
  - Read the section on the goods and money markets (page 604) and then read the section on the *IS* curve (pages 604–605).
  - Read the Appendix (pages 615-620). This covers the *LM* curve, equilibrium and changes in equilibrium.

- There is an error on page 615. Under the subheading 'The *IS* curve', the first sentence in the second paragraph should end as follows: ' … investment and a *rise* in saving.'

- This topic is new to Subject CB2, but it was in the pre-2010 CT7 syllabus and therefore there are past exam questions to study.

3.3 Reading

Task	√when completed
Read Chapter 19, pages 604-605, 615–620.	☐

3.4 Checklist

Task	√when completed
Ensure that you can:	
• define the following key term:	
– *IS-LM* model	☐
• derive the *IS* curve	☐
• distinguish between a movement along and a shift in the *IS* curve	☐
• explain the two determinants of the slope of the *IS* curve	☐
• distinguish between Keynesian and monetarist views of the slope of the *IS* curve	☐
• give examples of factors that would cause a shift in the *IS* curve	☐
• derive the *LM* curve	☐
• distinguish between a movement along and a shift in the *LM* curve	☐
• explain the two determinants of the slope of the *LM* curve	☐
• distinguish between Keynesian and monetarist views of the slope of the *LM* curve	☐
• give examples of factors that would cause a shift in the *LM* curve	☐
• explain and draw *IS-LM* diagrams to show:	
– equilibrium in the goods and money markets	☐
– how equilibrium is restored if initially at disequilibrium	☐
– a change in the goods market	☐
– a change in the money market	☐
– the influence of the slopes of the *IS* and *LM* curves on the effect of changes in the goods and money markets	☐
– the impact of fiscal and monetary policy used individually and together.	☐

3.5   Questions

Question

Explain what *IS* and *LM* curves show. Use an *IS-LM* graph to explain how the equilibrium real national income and real interest rate are determined.

Solution
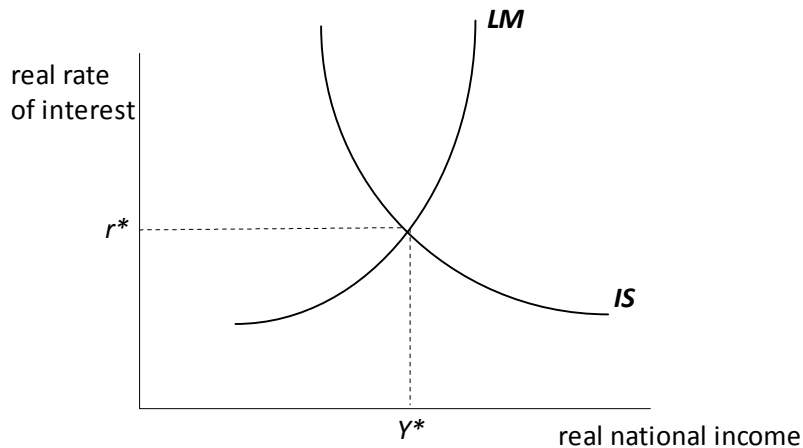
The *IS curve* is the locus of the combinations of the real interest rate and real national income such that the market for goods and services is in equilibrium. This occurs when aggregate demand is equal to national income or, equivalently, when injections are equal to withdrawals, so that there is no reason for the level of real national income to change.

The *LM curve* is the locus of combinations of the real interest rate and real national income such that the money market is in equilibrium, so that the demand for money is equal to the supply of money. It is drawn for a given money supply.

The *IS* curve slopes downwards because, starting from equilibrium in the goods market, if the real interest rate is reduced, then consumption and investment will rise, increasing aggregate demand and hence real national income. Thus, a lower real interest rate is associated with a higher level of real national income in the goods market.

In contrast, the *LM* curve slopes upwards because starting from equilibrium in the money market, a rise in real national income will increase money demand. Thus, for a given money supply, a higher real interest rate is needed to choke off the excess money demand and so maintain equilibrium in the money market.

At the point where the curves intersect, both markets are in equilibrium. This point therefore represents equilibrium in the economy as a whole, (*r*, Y**).

Question

Which of the following would cause the *IS* curve to shift to the right?

A   an increase in business confidence
B   a decrease in interest rates
C   an appreciation of the currency
D   an increase in the money supply

Solution

Option A. The *IS* curve will shift to the right if there is an increase in any of the injections for reasons other than a fall in interest rates. An increase in business confidence (Option A) will increase investment and hence increase injections. A decrease in interest rates (Option B) will cause a downward *movement along* the *IS* curve. An appreciation of the currency (Option C) will make exports more expensive and imports less expensive so there is likely to be a decrease in net exports and the *IS* curve will shift to the *left*. An increase in the money supply (Option D) will cause the *LM curve* to shift to the right.

Question

Which of the following could cause an increase in real interest rates and a decrease in real national income?

A   an increase in exports
B   the introduction of new savings schemes, which increases the desire to save
C   a decrease in the use of cash
D   the central bank's open market sales of government bonds

Solution

Option D.

An increase in interest rates and a decrease in national income will occur *if the LM curve shifts to the left*. The *LM* curve shifts if there is a change in the demand for or supply of money for reasons other than a change in national income. The *LM* curve will shift to the *left* (or upwards) if, for reasons other than a change in national income, there is an increase in the demand for money (since this would raise the interest rate for any given level of national income) or a decrease in the supply of money. The central bank's open market sales of government bonds would decrease the money supply (as money is removed from commercial banks to pay for the bonds) and hence cause the *LM* curve to shift to the left, with the consequent increase in interest rates and decrease in national income.

An increase in exports (Option A) would increase aggregate demand, shift the *IS* curve to the right, and hence result in higher interest rates but *higher* national income. An increase in savings (Option B) would cause a decrease in aggregate demand, a shift in the *IS* curve to the left and hence lower national income but *lower* interest rates. A decrease in the use of cash (Option C) would cause a decrease in the demand for money and a decrease in interest rates at the current level of national income, thus causing a *rightward* (or downward) shift of the *LM* curve, resulting in *higher* national income and *lower* interest rates.

Question

Using an *IS-LM* diagram explain the likely effects of the following on both the domestic interest rate and the level of economic activity:

(i)   a decrease in government spending

(ii)   a decrease in the money supply.

Solution

(i)   ***The effect of a decrease in government spending***

A decrease in government spending reduces aggregate demand and hence causes the *IS* curve to shift to the left.
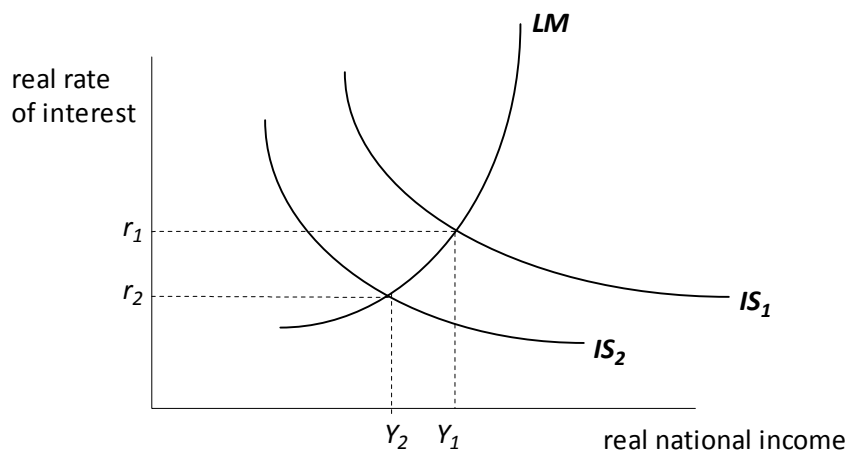
As can be seen in the diagram, this reduction in aggregate demand causes income to fall from Y_1 to Y_2. Since income falls, the transactions demand for money balances falls and, with a given money supply schedule, interest rates fall from r_1 to r_2.

(ii)   *Effects of a decrease in the money supply*

The authorities can achieve a decrease in the money supply by selling bonds in the open market. The decrease in the money supply causes the *LM* curve to shift to the left.

As can be seen in the following diagram, the sale of bonds causes interest rates to rise (to encourage investors to buy the bonds) from r_1 to r_2. As interest rates rise, individuals and firms reduce their borrowing and aggregate demand falls. Hence income falls from Y_1 to Y_2.
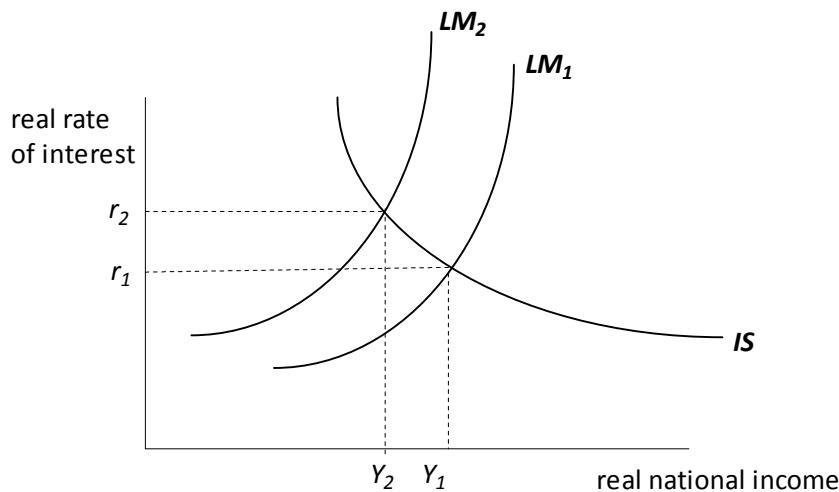
Notice that both policies reduce national income, but a decrease in government spending causes a fall in interest rates while a decrease in the money supply causes a rise in interest rates.

Question

Choose the appropriate words in the sentences below.

(i)   According to monetarists, the *IS* curve is flat/steep and …

(ii)   … the *LM* curve is relatively flat/steep.

(iii)   Therefore, they argue that an increase in government spending will have a relatively small/large effect on the level of real income.

Solution

(i)   flat

(ii)   steep

(iii)   small

In contrast, according to Keynesians, the IS curve is relatively steep and the LM curve relatively flat. Therefore, they argue that an increase in government spending will have a relatively large effect on the level of real income.

4   The *IS-MP* model

4.1   What's included in this section

- The *IS* curve

- The *MP* curve

- Equilibrium

- The full effect of changes in the goods and money markets

4.2   Guidance

As a guide to the reading, the following might be of help:

- The *IS-MP* model is a relatively new development of the *IS-LM* model that allows for the way in which monetary policy is now used in many countries. Rather than controlling the money supply directly, most central banks now set interest rates to influence aggregate demand and achieve its inflation target.

- The model has the following key features:
    - the *IS* curve shows the combinations of real national income and real interest rates at which there is equilibrium in the goods market (*IS* stands for investment = savings in the simple Keynesian model)
    - the *MP* curve (or monetary policy curve) shows the real interest rate that the central bank would choose for each level of real national income in order to achieve its inflation target (assuming that the potential national income is fixed and that inflation increases with the level of real national income)
    - equilibrium real national income and real rate of interest are given where the *IS* and *MP* curves intersect
    - the model does not assume constant prices, *ie* inflation can occur, so the *nominal* interest rate and national income are *not* the same as the *real* interest rate and national income.

- Since the *IS* curve was studied in the previous section, pages 604–605 might require just a quick overview.

- On page 607, one of the factors listed under factors that cause a shift in the *MP* curve is 'change in central bank policy'. Under this subheading the text discusses matters that would change the *slope* of the *MP* curve rather than change its *position*. However, it is worth pointing out that a way in which the central bank could cause the *MP* curve to shift is to adopt a 'looser' or 'tighter' monetary policy. This is discussed on page 609, under the subheading 'Shifts in the *MP* curve' in the second paragraph.

- Note that there is a typo on page 609. Under 'Shifts in both curves', on the fourth line, it should refer to Y_4 rather than Y_3.

- This topic is new to Subject CB2.

4.3   Reading

Task	*√when completed*
Read Chapter 19, pages 604–610.	☐

4.4   Checklist

Task	*√when completed*
Ensure that you can:	
• explain how the central bank sets the appropriate nominal interest rate (relative to the expected rate of inflation) if inflation rises above its target rate	☐
• derive the *MP* curve	☐
• explain why the slope of the *MP* curve gets steeper as the economy approaches full capacity	☐
• give four examples of factors that would cause a shift in the *MP* curve	☐
• explain and draw *IS-MP* diagrams to show:	
– equilibrium	☐
– how equilibrium is restored if initially at disequilibrium	☐
– a shift in the *IS* curve	☐
– a shift in the *MP* curve	☐
– a shift in both curves	☐
– the influence of the shapes of the *IS* and *MP* curves on the effect on real national income of shifts in the curves.	☐

4.5   Questions

Question

Which of the following statements is FALSE?

A   Central banks set the nominal interest rate.

B   Real interest rates determine aggregate demand.

C   The *ex ante* real interest rate is the nominal interest rate *less* the expected rate of inflation.

D   To raise real interest rates, the central bank must ensure that the nominal interest rate is above the expected rate of inflation.

Solution

Option D. For positive *ex ante* real interest rates, the nominal interest rate is *always* above the expected inflation rate. In order for the real interest rate to *rise*, the nominal interest rate must be *increased* relative to the expected inflation rate.

Question

The *MP* curve slopes upwards because:

A   a rise in national income increases the demand for money and, assuming a constant money supply schedule, causes interest rates to rise.

B   a rise in national income increases the demand for exports and raises interest rates.

C   a rise in interest rates causes an increase in aggregate demand and hence a rise in national income.

D   a rise in national income causes an increase in inflation, therefore causing the central bank to increase interest rates.

Solution

Option D.

Assuming that inflation is at its target level and that potential output is constant, an increase in aggregate demand will raise national income pushing the economy closer to its potential output. This will increase inflation, taking it above its target rate, and therefore cause the central bank to increase interest rates to bring inflation back to target. (Remember that *MP* stands for monetary policy.)

Option A is the explanation of the upward-sloping *LM curve*. Options B and C are not explanations of the upward-sloping *MP* curve, and they are also incorrect statements. A rise in national income would cause an increase in *imports*, not exports. A rise in interest rates would cause a *decrease* in aggregate demand.

Question

Which of the following would cause a rightward/downward shift in the *MP* curve?

I   a lower target inflation rate
II   an oil price increase
III   an increase in potential national income

A   I only
B   I and II only
C   II only
D   III only

Solution

Option D.

An increase in potential national income (Statement III) means that a given inflation rate (and therefore a given interest rate) will be associated with a higher level of national income.

Conversely, a lower inflation target (Statement I) means that a given level of national income will be associated with higher interest rates to achieve the lower target, *ie* the *MP* curve shifts *leftwards* (or upwards).

An oil price increase (Statement II) is a source of cost-push inflation, so for any level of national income, there will be a higher rate of inflation and hence higher interest rates will be required to reduce it. This would therefore also cause a *leftward* (or upward) shift in the *MP* curve.

Question

Which of the following statements is FALSE?

A   An increase in injections causes the *IS* curve to shift to the right, and the resultant rise in national income and hence inflation above its target causes the central bank to increase interest rates.

B   Looser monetary policy causes the *MP* curve to shift to the right (or downwards) and the lower interest rates cause higher investment and a movement along the *IS* curve to a higher level of national income.

C   A higher target for inflation causes the *MP* curve to shift to the left (or upwards) and the higher interest rates cause lower investment and a lower level of national income.

D   An increase in taxation causes the *IS* curve to shift to the left, a fall in national income and inflation to below its target, and hence a reduction in interest rates by the central bank.

Solution

Option C.

A higher target for inflation (*eg* 4% rather than 2%) means that a given level of national income requires a lower interest rate to keep inflation on target, so the *MP* curve shifts *downwards*. This causes interest rates to fall, investment to rise and a movement along the *IS* curve to a higher level of national income.

Note that a looser monetary policy (Option B) means that the central bank sets a lower interest rate for a given national income.

Question

Are the following sentences TRUE or FALSE?

(i)　　The effect of a shift in the *IS* curve on national income is greater if the *MP* curve is flatter.

(ii)　　If both aggregate demand and potential national income increase, national income can rise without the central bank having to raise interest rates to curb inflationary pressures.

(iii)　　An increase in inflationary expectations will cause a greater increase in interest rates if the *IS* curve is flatter.

Solution

(i)　　True.

(ii)　　True.

(iii)　　False. An increase in inflationary expectations causes an upward shift in the *MP* curve, since a given level of national income requires a higher interest rate to keep inflation on target. If the *IS* curve is flattish, only a relatively small increase in interest rates is required to reduce aggregate demand sufficiently to achieve the target inflation rate.

Module 18 Practice Questions

18.1   Consider an economy where the demand for real money balances and the demand for investment are both highly interest-elastic. A change in the money supply will give:

A   a relatively small change in the rate of interest and the level of investment.

B   a relatively large change in the rate of interest and the level of investment.

C   a relatively large change in the rate of interest and a relatively small change in the level of investment.

D   a relatively small change in the rate of interest and a relatively large change in the level of investment.   [1½]

18.2   An increase in government expenditure financed by government borrowing from the non-bank private sector is most likely to:

A   increase the supply of money, reduce interest rates and increase national income.

B   increase the demand for money, reduce interest rates and cause private sector investment to rise.

C   increase the demand for money, increase interest rates and cause private sector investment to fall.

D   increase the demand for and the supply of money, leave interest rates unchanged and increase national income.   [1½]

18.3   Points on the *IS* curve show combinations of real Gross Domestic Product (GDP) and the rate of interest where:

A   the economy is at full employment.
B   the money market is in equilibrium.
C   aggregate demand equals aggregate supply so that the product market is in equilibrium.
D   both the product and money markets are in equilibrium.   [1½]

18.4   Explain the theory behind how monetary policy can be used to control inflation and discuss some of the practical problems associated with using monetary policy to control inflation.   [10]

18.5   (i)   Using a single diagram plot an *IS* curve and an *LM* curve. Explain what these curves and their point of intersection denote.   [5]

        (ii)   Use the *IS-LM* model to explain and illustrate crowding out resulting from an increase in government spending.   [5]
                                                                                              [Total 10]

18.6   Using a diagram of the *IS-MP* model, explain the effects on real interest rates and real national income of an increase in investment in new technology that increases potential national income.
                                                                                              [5]

The solutions start on the next page so that you can
separate the questions and solutions.

Module 18 Solutions

18.1   *This question is Subject CT7, September 2016, Question 23.*

Option D.

For illustration, consider an *increase* in the money supply. As shown on the diagram below, this will lead to a *decrease* in interest rates so that the supply and demand for money can be brought back into equilibrium.
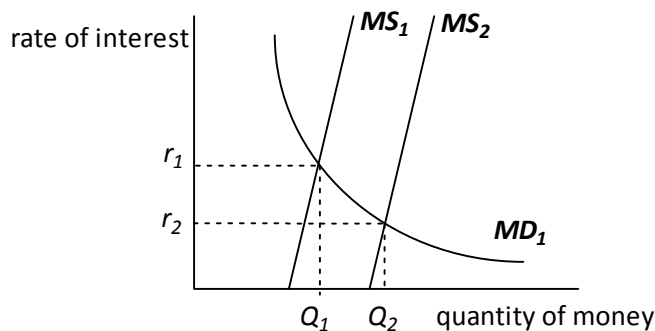
The extent to which interest rates will change in response to a change in the money supply depends upon the slope of the money demand curve. If, as in this question, money demand is elastic, *ie* the demand curve is flattish, then only a relatively small fall in interest rates is required. This means that one of Options A and D must be the correct answer.

Let's now consider the effect of a change in interest rates on investment by firms. Almost by definition, if the demand for investment is highly interest-elastic, *ie* very sensitive to interest rates, then it will change considerably in response to even a small reduction in interest rates. The correct answer is therefore Option D.   [1½]

18.2   Option C. If the government finances its expenditure by borrowing from the non-bank private sector, there will be no change in the money supply curve. By increasing government expenditure, injections increase, so national income will increase. However, the resulting increase in the demand for active money will increase interest rates (given that the money supply curve is unchanged) and hence cause a fall in investment. Option D gives the outcome of an increase in government expenditure financed by borrowing from the central bank or in the form of bills from the commercial banks, both of which increase the money supply.   [1½]

18.3   *This question is Subject CB2, Specimen Exam Paper 2019, Question 23.*

Option C. By definition. Notice that the question refers to the 'product' market whereas the textbook refers to the 'goods' market.   [1½]

18.4 *This question is Subject 107, April 2000, Question 37(ii).*

The rationale for using monetary policy to control inflation stems from the quantity theory of money. [½]

This theory is based on the *equation of exchange*:

$$MV = PY$$

where M is the money supply, V is the velocity of circulation (the number of times the money supply changes hands in a period of time), P is the price level, and Y is the level of real income or output (*ie* real GDP). [1]

The *quantity theory of money* assumes that both V and Y are constant, so that the inflation rate is directly determined by the rate of growth of the money supply. The monetarist school of economists therefore argues that governments should keep tight control of the money supply to control inflation. [1]

Also, by sending out a signal that a tough monetary stance is being adopted, expected inflation might fall, which will help to reduce actual inflation. [½]

The main criticism of this theory lies in the assumptions that it makes. In practice, a reduction in M might lead to a compensating increase in V, leaving national income unchanged. It is also possible that a decrease in M might lead to a decrease in Y, *ie* lower output, rather than a decrease in P. [1]

Another criticism of the theory is that it doesn't say *how* the change in price occurs. However, other aspects of monetary theory help us to fill in the gaps. The *transmission mechanisms* are assumed to work as follows:

- a decrease in the money supply will cause an increase in interest rates

- the increase in interest rates will cause a decrease in investment and consumption …

    … and will encourage an inflow of hot money and therefore an increase in the exchange rate

- the higher value of the currency will cause a decrease in net exports

- the resulting decrease in aggregate demand will reduce the demand-pull inflationary pressures within the economy. [½ each]

In addition, the higher exchange rate will reduce the domestic currency cost of imports, so reducing cost-push inflation. [½]

The practical problems encountered with the use of contractionary monetary to control inflation could include:

- *The choice of monetary target.* Narrow money is easier to control but it is probably not the best indicator of monetary conditions. [½]

- *Problems of control.* Many governments have tried and failed. There are many techniques of controlling the broad money supply, such as open market operations and minimum reserve ratios, but equally, there are many other influences on the money supply (*eg* the public's desire for bank loans), so the power of the authorities is limited. [1]

- *An elastic demand for money function.* If the demand for money is relatively elastic, a decrease in the money supply will lead to a relatively small rise in interest rates and hence exchange rates.   [1]

- *An unstable demand for money function.* If the demand for money is volatile (*eg* because of changing expectations of inflation or interest rates), it is difficult to predict the effect of a change in the money supply on interest rates.   [1]

- *The insensitivity of aggregate demand to interest rates*. If investment and consumption spending are interest-inelastic, then any increase in interest rates will produce only a moderate decrease in the level of demand and hence demand-pull inflation.   [1]

- *An unstable demand for investment.* If the demand for investment is volatile (*eg* because of changing levels of confidence, well-being or availability of finance), it is difficult to predict the effect of a change in the money supply on interest rates.   [1]

- *Uncertainty*. More generally, it may be difficult to predict with certainty the exact impact of tighter monetary conditions on aggregate demand. In addition, faced with a decrease in aggregate demand, firms might reduce output and employment rather than prices.   [1]

- *Timing difficulties*. It may be difficult to time monetary policy appropriately. In particular, the effects of a tighter monetary policy may take a year or two to work through the economy, by which time inflation may no longer be an important problem. The monetary tightening might therefore hit an economy that is already heading towards recession, only making the situation worse.   [1]

- *Effect on business costs.* The immediate effect of any increase in interest rates will be to increase firms' financial costs, which in itself may be a factor contributing to cost-push inflation.   [½]

- *Effect on other objectives.* If the inflation has been caused by demand-pull pressures and the economy is booming, with a high (and perhaps unsustainable) rate of economic growth, then a dampening of aggregate demand by contractionary monetary policy may be appropriate.   [½]

   However, if the economy is suffering from cost-push inflation, often associated with a slump, then cutting aggregate demand may deepen the slump, decreasing output and increasing unemployment.   [½]

   Although monetarists argue that any unemployment will be short-lived because labour markets will adapt to lower inflation, wages will fall and disequilibrium unemployment will be eliminated, Keynesians argue that wages are sticky downwards so disequilibrium unemployment could persist and do long-term damage to the economy.   [1]

In addition, a contractionary monetary policy is likely to reduce consumer and business confidence and reduce investment, thereby damaging long-term economic growth prospects.   [1]

Finally, any decrease in net exports may result in a current account deficit.   [½]

[Maximum 10]

18.5   *This question is Subject CT7, April 2005, Question 37 (part).*

(i)   ***The IS and LM curves***
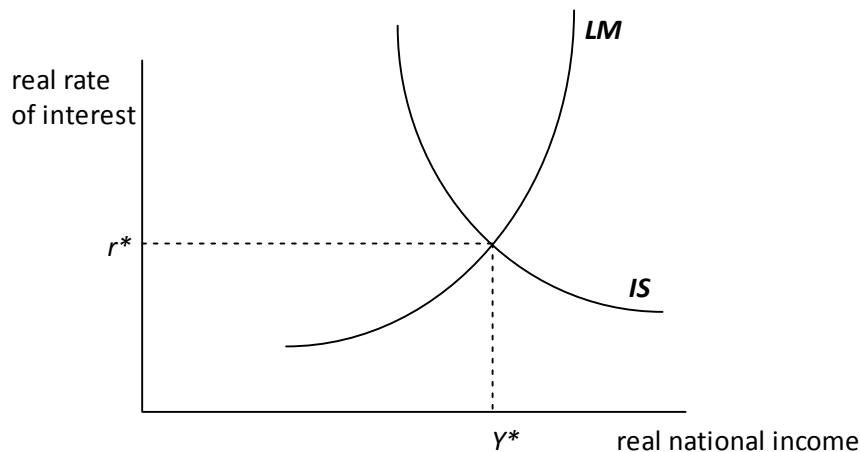
[1]

The *IS curve* shows the combinations of real interest rates and real national income at which there is equilibrium in the goods market. This occurs when injections equal withdrawals or equivalently, when aggregate demand is equal to national income.   [1]

The curve slopes downwards since, as the interest rate falls, aggregate demand (mainly investment and consumption) rises and hence equilibrium national income rises.   [1]

The *LM curve* shows the combinations of real interest rates and real national income at which there is equilibrium in the money market. The money market is in equilibrium when the demand for money is equal to the supply of money.   [1]

The curve slopes upwards since, if there is an increase in national income, there will be an increase in the transactions and precautionary demand for money and consequently, given an unchanged money supply curve, an increase in the interest rate.   [1]

The point of intersection of the two curves shows the level of real income (Y^*) and the real interest rate (r^*) that will ensure that both the money market and the goods market are in equilibrium.   [1]

[Maximum 5]

(ii)   *Crowding out resulting from an increase in government expenditure*
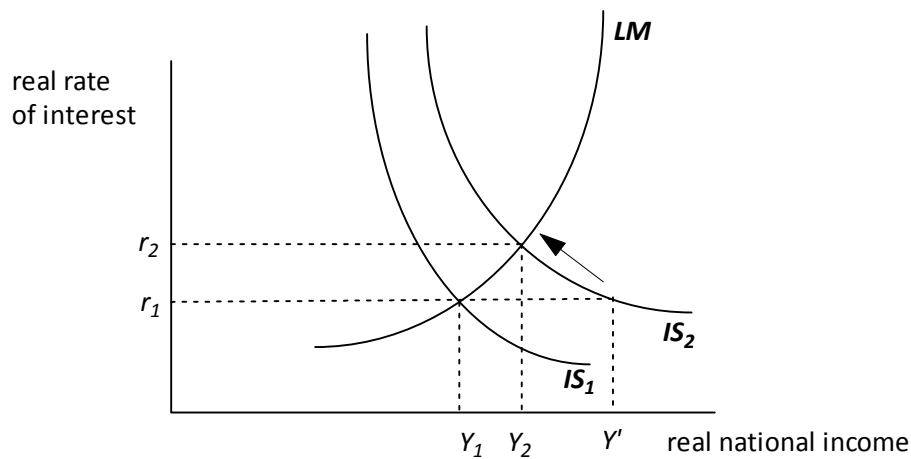
[1]

An increase in government spending increases aggregate demand and hence increases national income. This shifts the *IS* curve to the right from IS_1 to IS_2, indicating an increase in the equilibrium national income at each rate of interest.   [1]

If there were no impact on the money market, *ie* if interest rates remained at r_1, equilibrium income would rise to Y'. The increase from Y_1 to Y' is the increase predicted by the original Keynesian model, *ie* the change in government spending multiplied by the multiplier.   [1]

However, as income increases, the demand for money increases and, assuming the money supply curve remains constant, interest rates have to rise to restore equilibrium in the money market, *ie* there is a movement along the *LM* curve.   [1]

This increase in interest rates from r_1 to r_2 .then has a contractionary effect on aggregate demand, as can be seen by the movement along the *IS* curve to the left as interest rates rise. Private sector investment and consumption are likely to fall as interest rates rise.   [1]

The ultimate effect on income is therefore an increase of Y_1 to Y_2, not Y_1 to Y'. The extent to which income rises depends on the extent of crowding out, which depends on the shapes of the *IS* and *LM* curves.   [1]

Crowding out can be avoided by increasing the money supply.   [½]

[Maximum 5]

18.6   The *IS-MP* model shows the relationship between real national income and real interest rates when central banks set interest rates to target inflation.   [½]

The IS curve shows the combinations of real interest rates and real national income that give equilibrium in the goods market, (ie where aggregate demand is equal to aggregate supply).

The MP curve shows the real interest rate that the central bank would set for each level of real national income in order to achieve its inflation target (assuming a fixed potential national income and that inflation increases with the level of real national income).

An increase in investment in new technology has an impact on both the *IS* curve and the *MP* curve. The effects can be seen in the following diagram.
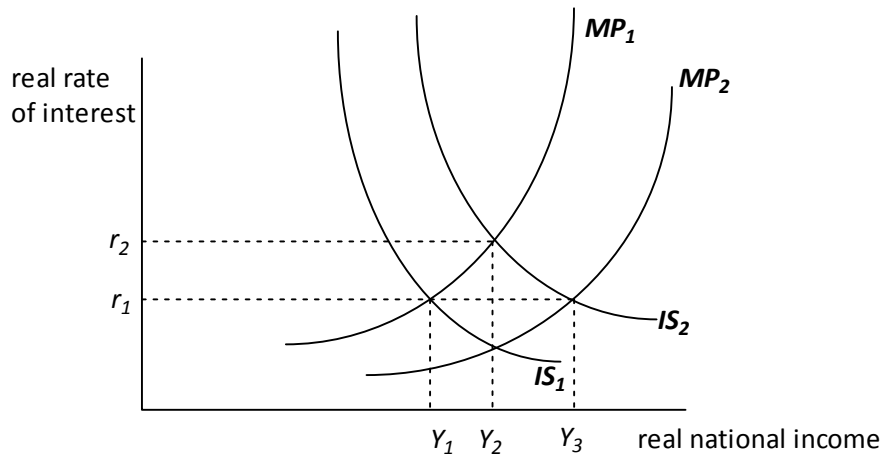
[1]

Assume that initially the economy is in equilibrium with real national income at Y_1 and the real interest rate at r_1.

Investment is an injection, so an increase in investment increases aggregate demand and hence shifts the *IS* curve to the right, from IS_1 to IS_2.   [½]

This alone would cause an increase in national income, closer to its potential income, and an increase in inflationary pressures.   [½]

The central bank would respond to this by increasing the interest rate, so the new equilibrium would be at national income Y_2 and interest rate r_2.   [½]

However, the improvements in technology raise the potential level of national income, so the *MP* curve also shifts to the right, from MP_1 to MP_2.   [½]

This is because a given level of inflation (and hence interest rate) will be associated with a higher level of national income.   [½]

This means that the increase in aggregate demand can now more easily be met by supply, so that there are no additional inflationary pressures and the central bank does not have to raise interest rates.   [½]

The new equilibrium position is at income Y_3 and interest rate r_1.   [½]

[Maximum 5]

In practice, the final interest rate need not be exactly equal to r_1. Consequently, a diagram showing a final interest rate that is slightly higher (or slightly lower) than r_1 would also be acceptable.

19

Supply-side policy

Syllabus objectives

3.11   Assess how supply-side policies impact on businesses.

1.   Describe the effect of supply-side policies on business and the economy.

2.   Describe the types of supply-side policies that can be pursued and discuss their effectiveness.

3.   Explain the impact on business of a policy of tax cuts.

4.   Describe the major types of policy open to governments to encourage increased competition.

Core Reading

Chapter 23 (Sections 4, 5 and 6)   Pages 729–743

0   Introduction

We have already looked at government policies designed to correct market failure in Module 10. This module considers how governments can use supply-side policies to increase total long-term output, *ie* aggregate supply, by increasing the productivity of factor inputs and/or the quantities available.

Supply-side policies are macroeconomic policies in that they aim to meet the macroeconomic objectives of output, employment and inflation, and by reducing production costs, they may also increase net exports. In contrast, demand-side policies, which aim to influence total spending, *ie* aggregate demand, are covered in Module 15 (The money market and monetary policy) and the next module (Demand-side policy). Supply-side policies are covered in general terms in Section 1.

The two main types of supply-side policy are market-orientated policies (which emphasise the role of the markets and are covered in Section 2) and interventionist policies (which emphasise government intervention and are covered in Section 3).

1   Approaches to supply-side policy

1.1   What's included in this section

- Macroeconomic objectives and supply-side policies

- The new classical approach

- The Keynesian approach

- 'Third Way' supply-side policies

- The link between demand-side and supply-side policies

1.2   Guidance

This relatively short section gives an introduction to the main aims of supply-side policy in terms of economic growth (through increased productivity and technological progress), and unemployment and inflation that are *not* linked to demand. As a general introduction to the rest of the material in this module, it should be quite quick to work through.

It is important to be clear about the difference between market-orientated policies and interventionist policies, and to be able to give plenty of examples of each.

Note that the reading in this section refers to the *DAD-DAS* model, which is covered in Chapter 20, Section 4 of the textbook, however, this is not part of the Core Reading.

1.3   Reading

Task	√*when completed*
Read Chapter 23, pages 729–731.	☐

1.4   Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– supply-side policies	☐
– market-orientated supply-side policies	☐
– neo-Austrian / libertarian school	☐
– interventionist supply-side policies.	☐

Task	√*when completed*
Continued Ensure that you can: • discuss the aims of supply-side policies • distinguish between the two main types of supply-side policy and the intermediate 'Third Way' approach • give examples to illustrate the links between demand-side and supply-side policies.	 □ □ □

1.5   Questions

Question

Which of the following are potential aims of supply-side policy?

I	to reduce unemployment
II	to reduce inflation
III	to reduce output

A	I and II
B	II and III
C	I only
D	II only

Solution

Option A. Supply-side policy aims to *increase* total output, *ie* aggregate supply.

Question

Which of the following would NOT be classed as a supply-side policy?

A	cutting marginal rates of tax to encourage entrepreneurs to stay in the economy
B	cutting short-term interest rates to encourage consumer spending
C	increasing the productivity of labour by providing better education and training
D	increasing the supply of child care to encourage people with children to resume work

Solution

Option B. Reducing short-term interest rates to encourage consumer spending (through increased borrowing and reduced saving) is an example of demand-side policy.

Question

A policy that involves increased government spending on infrastructure projects is unlikely to be part of:

A   a demand-side policy.

B   an interventionist supply-side policy.

C   a 'Third Way' supply-side policy.

D   a market-orientated supply-side policy.

Solution

Option D. Market-orientated supply-side policies encourage *private* enterprise, and reduce the role of the government. Note that government spending is a component of aggregate demand, so this could well be part of a demand-side policy.

2 Supply-side policies in practice: market-orientated policies

2.1 What's included in this section

- Market-orientated policies in the 1980s

- Government spending

- Taxes and the labour market

- Taxes, business and investment

- Reducing the power of labour

- Reducing welfare

- Policies to encourage competition

2.2 Guidance

This section discusses market-orientated supply-side policies, which involve freeing up the market by removing or reducing government intervention, so as to encourage private enterprise. It uses the labour market diagrams that were introduced in Module 12 to illustrate the effects of market-orientated supply-side policies on unemployment.

Bear in mind when reading through this section that market-orientated supply-side policies typically involve the government *reducing* its role in the markets. This will leave a gap that must be filled by the private sector, and in theory, the profit incentive means that the private sector should be more efficient.

2.3 Reading

Task	√when completed
Read Chapter 23, pages 732–737.	☐

2.4   Checklist

Task	√when completed
Ensure that you can:	
• describe the following market-orientated supply-side policies and discuss their aims and effectiveness:	
– reducing government spending	☐
– reducing taxes to influence the labour market and investment	☐
– reducing the power of labour	☐
– reducing welfare	☐
– privatisation	☐
– deregulation	☐
– introducing market relationships into the public sector	☐
– public-private partnerships	☐
– encouraging free trade and free capital movements	☐
• illustrate on a labour market diagram the impact of:	
– reducing the marginal rate of income tax	☐
– reducing the power of labour	☐
– reducing welfare benefits.	☐

2.5   Questions

Question

Which of the following is NOT a *market-orientated* supply-side policy?

A   measures to reduce the power of trade unions
B   introduction of public-private partnerships
C   removal of barriers to trade and capital movements
D   provision of factories in depressed areas

Solution

Option D. The provision of factories in depressed areas is an *interventionist* supply-side policy.

Question

Explain why reducing the rate of income tax by 2% might not lead to an increase in the labour supply.

Solution

The *substitution effect* of the tax cut might encourage people to work more hours (*ie* they may wish to substitute work for leisure) as the higher take-home pay has increased the opportunity cost of leisure. However, they may be unable to do so. Workers may not have the opportunity to increase their hours of work.

A reduction of 2% in the rate of income tax, say, may not be sufficient incentive to work more.

Non-workers may be unable to find employment as they have the wrong skills or there are no jobs available.

The reduction in income tax may actually lead to a *reduction* in labour supply. This is because workers can earn the same amount of money in less time, and is called the *income effect* of the tax cut.

Question

Explain why the existence of trade unions increases the power of labour.

Solution

In a perfectly competitive labour market without trade unions, wages are set according to the supply and demand for labour.

However, trade unions can create a monopoly in the supply of a particular type of labour. They can use their monopoly power to increase the price of labour (*ie* wages) above the levels of a competitive market.

Question

A government is proposing to build a school under a public-private partnership. A private contractor will be chosen to build and maintain the school buildings and in return the government will pay rent to the contractor.

Discuss the advantages and disadvantages of this proposal.

Solution

Advantages

The contractor will meet the costs of building the school, so the government does not need to borrow money or raise taxes now.

Competition between contractors should drive down the rent charged by the winning contractor.

The winning contractor may have greater expertise in maintaining the school than the government's own employees.

The risk of increases in the cost of building / maintaining the school is transferred to the contractor.

Disadvantages

The contractor will charge not only for the expected cost of the project but will also charge a loading for risk and profit.

Cost control may be weak, resulting in a higher burden for the taxpayer in the long run.

The government loses some control over the quality of the project and the contractor may have lower standards than the government.

The overall cost to the taxpayer might be higher than if the government built and maintained the school.

3   Supply-side policies in practice: interventionist policies

3.1   What's included in this section

- The case for intervention

- Examples of interventionist supply-side policy

- Regional and urban policy

3.2   Guidance

This section discusses interventionist supply-side policies, which involve government intervention to counteract the deficiencies of the market. This ties in closely with Module 10 (on market failure and government intervention). Here we concentrate particularly on the low levels of investment, R&D, education and training in the UK and the interventionist measures that can be taken to increase them.

Box 23.5 (*not* Box 23.3 as referred to in the first paragraph on page 738) contains a case study of how industrial policy in the UK has changed in recent years and it might be useful in bringing the theory to life.

3.3   Reading

Task	*√when completed*
Read Chapter 23, page 738–743.	☐

3.4   Checklist

Task	*√when completed*
Ensure that you can:	
• define the following key terms:	
– industrial policies	☐
– regional multiplier effects	☐
• explain why interventionist policies are thought necessary, *ie* why there are low levels of investment, R&D, education and training	☐
• give examples of interventionist supply-side policy	☐
• discuss the causes of regional imbalances and the policies that could be used to reduce / correct them.	☐

3.5   Questions

Question

Give three reasons why training might improve a country's economic performance.

Solution

1.   Training can give unemployed individuals the skills necessary to take up any available jobs.

2.   Training might improve the productivity of labour, *ie* more output can be produced for the same amount of labour.

3.   Better trained staff will be more able to pick up new ideas, making it easier for firms to innovate and introduce new processes.

Question

Outline why investment in the rail network might be higher under nationalised rather than privatised ownership.

Solution

A private railway company will only invest in expanding the rail network if the value of the additional future revenues from passengers and freight exceed its capital expenditure, so that it can increase its profits.

However, a nationalised industry may consider wider issues of benefit to the nation. For example, increased use of railways may reduce congestion on roads, reduce travelling time, reduce costs for business and/or reduce pollution.

Question

One of the arguments in favour of *interventionist* supply-side policy is that:

A   the free market results in the most efficient allocation of resources.
B   the private sector is less bureaucratic than the public sector.
C   the 'free-rider' problem results in too little R&D, investment and training.
D   deregulation increases competition.

Solution

Option C. One of the arguments in favour of *interventionist* supply-side policy is that the free market fails to provide sufficient R&D, investment and training because firms 'free ride' on the investment of other firms. The other options given in the question are advantages of the *market-orientated* approach to supply-side policy.

Question

Which of the following policies will NOT help to address the problem of regional imbalance?

A   reduced employers' national insurance contributions for firms in depressed areas

B   grants to unemployed workers in depressed areas to relocate in more prosperous areas

C   provision of factories in depressed areas

D   siting of government offices in depressed areas

Solution

Option B. This increases regional imbalance. Via the regional multiplier, the depressed area suffers further decline as workers (and their spending power) leave; and the prosperous areas become more prosperous as workers and their spending power enter.

Module 19 Practice Questions

19.1 Which of the following would constitute a supply-side economic policy for reducing unemployment?

Exam style

A   increasing social security benefits
B   increasing the money supply
C   reducing corporate and personal taxation
D   increasing government expenditure aimed at exploiting the multiplier effect   [1½]

19.2 Which of the following is NOT a supply-side economic policy aimed at promoting economic growth?

Exam style

A   cuts in social security benefits designed to encourage more workers to take work
B   measures designed to reduce trade union powers
C   deregulation
D   tariffs designed to increase the production of domestic goods   [1½]

19.3 Explain why market-orientated supply-side policies may be superior to interventionist supply-side policies and describe three possible market-orientated supply-side policies.   [5]

Exam style

The solutions start on the next page so that you can
separate the questions and solutions.

☐ABC Module 19 Solutions

19.1   *This question is Subject CT7, September 2011, Question 14.*

Option C.

Supply-side policies are designed to increase the long-run potential output of the economy. They can be market-orientated or interventionist. Market-orientated supply-side policies aim to increase the efficiency of markets. Reducing corporate taxation should increase the incentive to invest in new capital equipment and reducing personal taxation should increase the incentive to work.

The other options given are all demand-side policies, *ie* they aim to reduce unemployment by stimulating aggregate demand.   [1½]

There is an overlap here. It could be argued that reducing corporate and personal taxation is a demand-side policy in that it increases investment and consumer spending and hence increases aggregate demand. This would be true. It depends on the government's intention. Are they introducing this policy to increase aggregate demand or are they introducing it to increase incentives and hence improve the supply side of the economy? However, the other options given could not be interpreted as supply-side policies.

19.2   *This question is Subject CT7, April 2013, Question 20.*

Option D.

Supply-side policies are designed to increase *aggregate supply* directly, (*ie* independently of aggregate demand), by increasing the quantity of factors of production and/or improving their productivity. Note that the main factors of production are labour, capital, land and raw materials.

Option A – cuts in social security benefits designed to encourage more workers to take work – should increase the quantity of labour.

Option B – measures designed to reduce trade union powers – should increase the flexibility of the labour market and hence reduce wages, leading to higher profits, higher investment and therefore higher growth.

Option C – deregulation – involves the removal of monopoly rights, which should promote increased competition and hence increase efficiency / productivity and output.

Option D – tariffs designed to increase the production of domestic goods (by making them cheaper relative to imported goods) – should increase *aggregate demand*, and so this is a demand-management (rather than a supply-side) policy. The *removal* of tariffs and the opening up of the economy to free trade and hence greater competition is an essential element of market-orientated supply-side policy.   [1½]

19.3   Market-orientated supply-side policies may be superior to interventionist supply-side policies
        because interventionist policies might:

- increase bureaucracy and waste   [½]

- reduce market incentives, *eg* the incentive to work and invest   [½]

- allow inefficient firms to survive   [½]

- change with changes in governments, making it difficult for firms to plan ahead.   [½]

Market-orientated supply-side policies include:

- reducing the tax burden on workers, savers and firms to increase the incentive to work,
  save and invest

- reducing labour power (by keeping the minimum wage low (or removing it altogether) or
  reducing the monopoly power of trade unions) to reduce labour costs, increase profits,
  increase investment and increase output and employment

- reducing welfare payments to reduce/remove the 'poverty trap' and increase the
  incentive to work and relocate if necessary

- encouraging competition, *eg* by privatisation and deregulation, to increase investment
  and efficiency, and hence national output

- removing trade barriers to allow raw materials and components to be bought from the
  cheapest source, and also to increase competition and hence efficiency

- removing restrictions on international capital movements to allow capital to be allocated
  to the projects in which it will be most effective.   [1 each, maximum 3]
                                                                                    [Total 5]

20

Demand-side policy

Syllabus objectives

1.3   Analyse the recent macroeconomic history.

    4.   Discuss the aftershocks in Europe following the 2008 financial crisis.

    5.   Assess the stimulus-austerity debate and regulatory action after the 2008 crisis.

3.10   Assess how macroeconomic policies impact on businesses.

    1.   Describe the types of macroeconomic policy that are likely to impact on business and explain the way in which this impact takes effect.

    2.   Describe the impact of fiscal policy on the economy and business, and factors that determine its effectiveness in smoothing out economic fluctuations.

    3.   Describe the fiscal rules adopted by the government and discuss if following these rules is a good idea.

    4.   Explain how monetary policy works in the UK and the Eurozone and describe the roles of the Bank of England and the European Central Bank.

    5.   Explain how targeting inflation influences interest rates and hence economic activity.

    6.   Discuss the merits of following a simple inflation target as a rule for determining interest rates, and suggest an alternative rule.

Core Reading

0   Introduction

This module discusses another important category of macroeconomic policy, namely fiscal policy.

Fiscal policy involves the use of government spending and/or taxes to influence the level of aggregate demand (*ie* total spending) in the economy and hence output and employment. So, just like monetary policy, which was discussed in Module 15, it is a form of *demand-side policy*.

In the context of the Keynesian model discussed in Module 16, fiscal policy can be used to:

* shift the *aggregate expenditure function* (*E*) upwards or downwards, leading to a multiplied increase or decrease in national income (*Y*)

* shift either the *injections function* (*J*) by changing government spending (*G*), resulting in the injections multiplier, or the *withdrawals function* (*W*) by changing taxation (*T*), resulting in the taxation multiplier.

Alternatively, in the aggregate demand/aggregate supply (*AD-AS*) model, a change in either *G* or *T* will shift the *AD* curve, leading to a change in both real GDP and the average price level.

In the context of the *AD-AS* model, the effects of fiscal policy will depend how far the *AD* curve moves and also the shape of the *AS* curve. This will, in turn determine the importance attached to the use of fiscal policy in meeting policymakers' economic objectives. However, in practice, policymakers do not know the exact shapes and positions of the various curves and so cannot predict exactly how effective, or otherwise, fiscal policy will be in meeting their objectives. Similar comments apply equally to the use of monetary policy to influence *AD*.

The first section of this module provides the background to the use of fiscal policy. It starts by outlining the two main roles of fiscal policy, namely influencing aggregate demand and aggregate supply respectively. It then introduces some concepts relating to government finances and key fiscal indicators. The second section explains how fiscal policy is intended to work. In particular, it looks at discretionary fiscal policy and some of the practical problems with its use. These result mainly from the unpredictability of its effects and the time lags associated with its use. The final section looks at the alternative approach of *fiscal rules* and discusses the case for and against rules and discretion. Once again, similar comments apply when considering the case for and against discretion and rules in the context of monetary policy.

The material in this module was examined fairly regularly in Subject CT7.

1   Fiscal policy and the public finances

1.1   What's included in this section

- Roles for fiscal policy

- Government finances: some terminology

- Key fiscal indicators

- The business cycle and the public finances

- The fiscal stance

1.2   Guidance

Fiscal policy is the use of government spending and/or taxes to influence aggregate demand, *ie* total spending within the domestic economy.

The first section of this module begins by outlining three possible roles for fiscal policy:

1.   influencing *aggregate demand* to *remove extreme inflationary or deflationary gaps*. For example, many governments used large expansionary fiscal policies to combat the global recession in 2008-09.

2.   influencing *aggregate demand* to smooth out cyclical fluctuations in the economy and thereby keep output gaps to a minimum, so-called *fine tuning*.

3.   influencing *aggregate supply*, *eg* via the government increasing its expenditure on education, training and infrastructure.

The text next introduces a number of definitions and key fiscal indicators relating to government spending and borrowing. If the government spends more than it receives in taxes, which is often the case even under normal economic circumstances, then it must borrow the difference, the *budget deficit*, *eg* by issuing government bonds. The result of such borrowing is the accumulation of a *national debt*, on which interest must be paid.

In this context, it is important to:

- understand the difference between a deficit, which is a *flow* concept and debt, which is a *stock* concept

- be familiar with the different definitions of deficit (or surplus) and debt.

The state of the public finances varies with the state of economy, with government borrowing reducing during periods of growth and increasing during recessions. However, public sector borrowing and hence the national debt of many countries increased substantially following the financial crisis of 2008, leading to concerns about the sustainability of the high levels of debt (see Box 22.1). Consequently, in the years since the crisis, many governments have tried to reduce borrowing by cutting spending and/or raising taxes, *ie* imposing austerity.

1.3   Reading

Task	√*when completed*
Read *Chapter 22*, pages 670–676.	☐

1.4   Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– fiscal policy	☐
– budget deficit and budget surplus	☐
– general government deficit (or surplus)	☐
– national debt	☐
– general government debt	☐
– current expenditure	☐
– capital expenditure	☐
– final expenditure	☐
– transfers	☐
– public sector net borrowing (PSNB)	☐
– public sector net cash requirement (PSNCR)	☐
– public sector net debt	☐
– public sector current budget deficit	☐
– primary surplus (or deficit)	☐
– structural deficit (or surplus)	☐
– fiscal stance	☐
• describe the main roles of fiscal policy with respect to aggregate demand and aggregate supply	☐
• outline the four key fiscal indicators that can be used to assess the financial position of the public sector	☐
• explain the influence of the business cycle on the public finances	☐
• describe the relationship between the size of the deficit or surplus (and changes in it) and the government's fiscal stance.	☐

1.5   Questions

Question

Explain the difference between the budget deficit, the national debt and the structural deficit.

Solution

The *budget deficit* (or surplus) in any given year, if there is one, is the actual amount by which *central* government spending exceeds (is below) its tax receipts.

The *national debt* is the accumulated value over many years of the budget deficits, less any surpluses. It represents the total amount of outstanding central government borrowing (owed both domestically and internationally).

The *structural deficit* is the public sector deficit that would occur if the economy were operating at the potential level of national income or output, *ie* where there is no excess or deficiency of aggregate demand and therefore a zero output gap.

Question

A situation in which public sector expenditure excluding interest payments on public sector debt exceeds public sector receipts is the definition of:

A   public sector net borrowing
B   a public sector current budget deficit
C   a primary deficit
D   public sector net debt

Solution

Option C.

Public sector net borrowing is defined as the excess of public sector expenditure over public sector receipts from taxation and the revenues from public corporations.

A *public sector current budget deficit* refers to the excess of public sector current expenditures over public sector receipts.

Public sector net debt is defined as gross public sector debt minus liquid financial assets.

Question

Which of the following statements is FALSE?

A   When the economy is growing, public sector net borrowing is likely to be falling.
B   When the economy is growing, net taxes are likely to be increasing.
C   When the economy is contracting, investment by firms is likely to be low.
D   When the economy is growing, the structural deficit is likely to be falling.

Solution

Option D. The *structural deficit* (*or surplus*) is the public sector deficit (or surplus) that would occur if the economy were operating at the potential level of national income or output, *ie* where there is no excess or deficiency of aggregate demand and therefore a zero output gap. It is therefore independent of the actual current state of the economy.

When the economy is growing (and GDP is increasing), net taxes (tax revenues less transfers) are likely to be rising and hence public sector net borrowing falling. When the economy is contracting, firms will typically be less confident about future economic prospects and so they are likely to invest less.

2   The use of fiscal policy

2.1   What's included in this section

- Automatic fiscal stabilisers

- The effectiveness of automatic fiscal stabilisers

- Discretionary fiscal policy

- The effectiveness of discretionary fiscal policy

- Problems of magnitude

- Problems of timing

- Fiscal rules

2.2   Guidance

Recall that *fiscal policy* is the use of government spending and/or taxes to influence aggregate demand, *ie* total spending on domestically produced goods and services.

In practice, government spending and taxation might adjust automatically to economic circumstances (and act as *automatic fiscal stabilisers*), or they might be altered by the government to achieve a specific set of objectives, or a set of general rules (*discretionary policy*). This section considers each of these approaches and how effective they might be.

Note that:

- *Monetary policy*, which was discussed in Module 15, also aims to influence aggregate demand and as such, is an alternative to fiscal policy.

- Even though they weren't highlighted in Module 15, many of the problems associated with fiscal policy, such as problems of magnitude and timing, apply equally to monetary policy (and indeed most macroeconomic policies, *eg* exchange rate policy. The particular problems of using monetary policy were further explored in Module 18 when discussing monetary transmission mechanisms.)

- The difficulties with discretionary policy have led to the increasing use of fiscal targets and rules, which we will discuss further in the next section.

- Boxes 22.2 and 22.4 provide an interesting discussion of the experience of using discretionary policy and rules and targets over the last 20 years in the UK and the EU, and, in particular, the reaction of governments to the financial crisis of 2008.

- Box 22.3 describes an intuitive and non-economics way of bringing some of these ideas to life!

It is also worth being aware that the use of fiscal, or monetary, policy to achieve one economic objective, *eg* reducing inflation, may conflict with achieving another objective, *eg* increasing output and employment.

In practice, the government may use a combination of fiscal, monetary and other polices, *eg* supply-side policies, rather than relying on just one of them in order to meet its economic objectives.

This material was examined fairly regularly in Subject CT7.

2.3   Reading

Task	√when completed
Read Chapter 22, pages 676–685.	☐

2.4   Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– automatic fiscal stabilisers	☐
– fiscal drag	☐
– discretionary fiscal policy	☐
– pure fiscal policy	☐
• outline the pros and cons of automatic fiscal stabilisers	☐
• state the three things that can be altered using discretionary changes in government spending and/or taxes	☐
• discuss the relative merits of changing government spending (G) and taxes (T), with reference to the tax multiplier	☐
• describe the problems of magnitude and problems of timing associated with the use of discretionary fiscal policy	☐
• outline the evolving fiscal frameworks in the UK and the Eurozone, with reference to:	
– the golden rule	
– the sustainable investment rule	
– the Stability and Growth Pact	
– the Fiscal Compact.	☐

2.5 Questions

Question

Which of the following will reduce the effectiveness of a pure fiscal expansion?

I   crowding out
II   injections multiplier
III   a lack of confidence on behalf of businesses and banks

A   I only
B   I and II
C   I and III
D   I, II and III

Solution

Option C. *Crowding out* is where increased government spending diverts money or resources away from the private sector, *eg* increased borrowing by the government causes higher interest rates and therefore decreased borrowing (and spending) by individuals and firms.

A lack of confidence on behalf of businesses may result in them failing to increase investment in response to a fiscal stimulus, perhaps because they think it won't be very successful. Likewise, banks may fail to increase lending if they continue to remain pessimistic about future economic prospects.

The injections multiplier means that an increase in *G* leads to a greater absolute increase in real GDP. It therefore *enhances* the effectiveness of expansionary fiscal policy.

NB A 'pure fiscal expansion' is one that involves no change in the money supply.

Question

Explain, with the aid of a numerical example, why an increase in government spending will have more effect at increasing GDP than a cut in taxation.

Solution

Consider an increase in government spending (*G*) of $10*m pa*. This will increase aggregate demand by $10*m* in the current year and will lead to a subsequent *multiplier effect* on national income. If the marginal propensity to consume domestically produced goods and services is $mpc_d = 0.75$, then the injections multiplier will be:

$$k = \frac{1}{1 - 0.75} = 4$$

So, the increase in *G* of £10*m pa* will ultimately increase national income by £40*m pa*.

A reduction in taxation increases disposable income and profits, and will increase consumer spending and investment. However, the effect of a reduction in taxation will be smaller than that of an increase in government spending because the additional income will not all be spent in the domestic economy.

Suppose the tax cut is in the form of a *lump-sum* tax, *eg* everyone receives a lump-sum tax rebate, then, if $mpc_d = 0.75$, only 75% of the $10*m* tax rebate will be spent on domestic products, *ie* $7.5*m*. *(The remainder being spent on savings and imports.)* It is this $7.5*m* that will then be subject to the multiplier effect, so tax cuts of $10*m pa* will only increase income by:

$7.5*m pa* × 4 = $30*m pa*

ie the multiplier effect from tax cuts is less than that from an increase in government spending.

In fact, the numerical value of the tax multiplier is always equal to one less than the value of the government expenditure multiplier. So, in the above question it is three and the tax multiplier effect can be calculated as $10m pa × 3 = $30m pa.

Question

In the context of fiscal policy, distinguish between problems of magnitude and problems of timing.

Solution

Problems of magnitude refer to the fact that the size of the effect of a change in government spending or taxation on national income is difficult to predict. This may be due to some or all of the following factors, the sizes of which cannot be predicted with certainty:

1.   A rise in government spending may simply *replace* private sector expenditure, *eg* on healthcare.

2.   A *pure fiscal expansion*, *ie* one that does not increase the money supply, may cause *crowding out*, whereby increased government spending diverts money or resources away from the private sector, *eg* increased borrowing by the government causes higher interest rates and therefore decreased borrowing (and spending) by individuals and firms. In the extreme, this crowding out could be total, *ie* national income would not increase at all.

3.   The effect of tax cuts will depend on the level of confidence in the economy (the less confident, the greater the tendency to save), who gets the tax cuts (the rich are likely to save more than the poor), and the state of financial well-being (a declining net worth position is likely to lead to higher savings).

4.   The multiplier effect depends on the size of the marginal propensity to consume domestically produced goods and services, which depends on attitudes to saving (which depend on expectations of the future) and spending on imports (which depends on the exchange rate).

5.   The accelerator and pump-priming effects all depend on business, bank and consumer confidence.

6.   Multiplier/accelerator interactions are virtually impossible to estimate, so small differences in investment can make a huge difference in eventual outcomes.

7.   The economy is subject to unpredictable random shocks, *eg* terrorist attacks.

Problems of timing occur as a result of the time lag before the policy takes full effect. They arise due to the time taken:

1.   to recognise the problem

2.   to consider appropriate actions

3.   to implement the changes

4.   for the changes to work their way through the economy via the multiplier and the accelerator. In particular, consumption may be slow to respond to changes in taxation.

These time lags mean that by the time the policy does take full effect, economic conditions may be quite different to those anticipated and so the policy may not be appropriate in the revised circumstances.

In fact, time lags could make fiscal policy *destabilising* rather than stabilising, *eg* if expansionary policies adopted to help the economy out of a recession did not take effect until the economy was actually out of recession and heading for a boom.

NB Remember that problems of magnitude (eg due to the unpredictability of the money multiplier) and timing (eg due to the time it takes for the effects of an interest rate change to spread throughout the economy) will also arise when using monetary policy.

3   The policy-making environment

3.1   What's included in this section

- The case for rules

- The case for discretion

- Central banks and a Taylor rule

- Conclusions (regarding the choice between rules and discretion)

3.2   Guidance

This section considers the relative merits of implementing macroeconomic policy, whether fiscal and/or monetary, by means of *rules* and *discretion.*

Both approaches have been used in practice and the choice between them depends upon a number of factors, including prevailing economic beliefs. It is therefore important to know and understand the advantages and disadvantages of each approach.

In practice, attaining a target for one variable (*eg* inflation) may lead to adverse consequences for other economic objectives (*eg* growth). Consequently, some economists advocate using a *Taylor rule*, which takes account of two objectives, typically inflation and real GDP or unemployment. Notice how the general form of the Taylor rule can be expressed in terms of an equation.

Finally, the section concludes by outlining some of the factors that influence the choice between discretion and rules in practice. Note that the section on p706 'Taylor rules and the *DAD/DAS* framework' refers to the *DAD/DAS* model, which is covered in Chapter 20 Section 3, and so is not part of Core Reading. However, given knowledge of the basic *AD-AS* model, covered in Module 11, this small section should not be difficult to understand.

Although most of this material appeared in the economics course prior to 2019, it was rarely examined. However, this may not be the case with the Subject CB2 exam, as the course is intended to provide a greater focus on recent economic history than was the case in Subject CT7.

3.3   Reading

Task	*√when completed*
Read Chapter 22, pages 704–707.	☐

3.4   Checklist

Task	√ when completed
Ensure that you can:	
• define the following key terms:	
– deficit bias	☐
– Taylor rule	☐
• explain the:	
– two main arguments against discretionary policy	☐
– arguments in favour of targets and rules	☐
– arguments in favour of discretionary policy	☐
– problems with targets and rules	☐
• discuss the use of a Taylor rule and illustrate the effect of different Taylor rules on the *DAD* curve	☐
• outline the five factors that will influence the choice between discretion and rules.	☐

3.5   Questions

Question

Which of the following Is one of the main arguments in support of the economic case for using discretionary policy rather than rules?

A   The government may use it to stimulate the economy in order to gain popularity before an election.

B   It can be tailored in response to specific economic shocks.

C   It can be used to influence expectations.

D   It is advocated by monetarists.

Solution

Option B. A main advantage of discretion is that policy can be tailored in response to the different economic shocks that cause the economy to fluctuate. For example, faced with a deep recession, the government could opt for larger rather than smaller increases in government spending to boost GDP. Alternatively, if inflation is the problem, the government could opt to use monetary policy, if it believes that would be more effective. However, in other circumstances, a combination of fiscal and monetary approaches might be deemed appropriate.

The potential for government abuse by using it for political purposes is deemed to be a *disadvantage* of discretion. Setting a target, *eg* for inflation, may influence expectations of inflation (and hence wage demands) making the target more easily achieved. This is a potential advantage of *rules*. Monetarists (and new classical economists) generally advocate the use of rules rather than discretion.

Question

Suppose inflation is currently above its target level of 2% *pa*. Which of the following policies is least likely to be used to be successful in reducing inflation back to its target level?

A   an increase in interest rates
B   a reduction in the rate of monetary growth
C   a reduction in the powers of trade unions
D   a reduction in income tax

Solution

Option D. A reduction in income tax is likely to increase consumer spending, thereby increasing aggregate demand and potentially demand-pull inflation. Conversely, Options A and B are likely to reduce investment and consumer spending, and hence demand-pull inflation, whereas Option C will reduce the ability of unions to increase wages and so reduce cost-push inflation.

Question

Describe the circumstances in which a discretionary demand-management policy might be preferred to a rules-based policy.

Solution

Discretionary demand-management policy is likely to be preferred to a rules-based policy if/when:

*   people have more confidence in the effectiveness of discretionary policy than rules

*   the economy proves to be inherently unstable, *ie* not self-stabilising

*   there are frequent large shocks to the economy, *eg* tsunamis, terrorism

*   people lack confidence in the effectiveness of rules and the ability of the government to stick to them

*   the government is able to adopt and speedily execute discretionary policies that have the desired effect (because it has expert analysts and forecasters).

Question

Explain, with reference to its equation, what is meant by a Taylor rule, and explain how the implementation of the rule affects the slope of dynamic aggregate demand (*DAD*) curve.

Solution

A *Taylor Rule* takes two economic objectives into account. It typically states how much the real interest rate must be raised if:

- inflation is above the target, or

- real GDP is above the potential level (or unemployment is below the natural rate).

The relative importance of the two objectives will be decided by the government or the central bank.

The general form of the Taylor rule equation is as follows:

$$r = r* + b\left(\pi - \pi*\right) + c\left(Y - Y_p\right)$$

where:

- r is the real interest rate set by the central bank
- $r*$ is the real interest rate consistent with long-run equilibrium in the economy
- π is the current inflation rate
- $\pi*$ is the target inflation rate
- Y is the current level of real GDP
- Y_p is the potential level of real GDP
- b, c are positive constants.

The equation implies that the central bank will raise the real interest rate if inflation goes above its target value or if real GDP goes above its potential level, with b and c representing the weights attached to the two economic objectives.

For example, a higher value of b indicates that the central bank is more concerned with high inflation. Consequently, it will raise the real interest rate more sharply when inflation is above its target level, resulting in a greater fall in real GDP and hence a flatter *DAD* curve.

Note that the DAD curve is essentially an AD curve with inflation on the vertical axis instead of the price level. It slopes downwards because an increase in inflation is assumed to lead to the central bank raising interest rates, resulting in a fall in AD and hence real national income.

Module 20 Practice Questions

20.1 The public sector deficit that would occur if the economy were operating at the potential level of national income is known as:

A   the budget deficit.
B   the general government deficit.
C   the primary deficit.
D   the structural deficit.   [1½]

20.2 Which of the following will result from an increase in government expenditure financed by increased government borrowing from the non-bank private sector?

A   a fall in the money supply
B   a fall in the inflation rate
C   a rise in the domestic interest rate
D   a fall in the money demand   [1½]

20.3 The extent of crowding out in response to an increase in government spending will be greater:

A   if investment is insensitive to interest rates.
B   the flatter is the money supply curve.
C   the flatter is the liquidity preference curve.
D   if the government implements a pure fiscal policy.   [1½]

20.4 (i)   Define *automatic fiscal stabilisers* and explain how they will reduce the extent of a recession.   [3]

(ii)   Discuss whether there is likely to be a similar stabilising effect arising from a change in monetary conditions in a recession.   [3]
                                                                                                    [Total 6]

20.5 Show why the numerical value of the tax multiplier is one less than that of the government expenditure multiplier.

20.6 (i)   Define fiscal policy.   [1]

(ii)   Explain, with examples, the main roles for fiscal policy in practice.   [5]
                                                                                                    [Total 6]

20.7 (i)   Explain how fiscal policy could be used to expand economic activity in the short run.   [5]

(ii)   Discuss the potential problems that may undermine the effectiveness of such a policy.   [5]
                                                                                                   [Total 10]

20.8 (i)   Explain the case for and against discretion.   [6]

(ii)   Outline the case for rules.   [4]
                                                                                                   [Total 10]

The solutions start on the next page so that you can
separate the questions and solutions.

Module 20 Solutions

20.1 Option D. This is the definition of the *structural deficit* from Section 1 of this module.

Recall that the *budget deficit* is the excess of central government's spending over its tax receipts. The *general government deficit* is the combined deficit of central and local government. The *primary deficit* is excess of public sector expenditure *excluding interest payments* on public sector debt over public sector receipts. [1½]

20.2 Option C. An increase in government expenditure financed by increased government borrowing from the non-bank private sector will not increase the money supply since there is no new money; it is just changing hands. Therefore Option A is incorrect.

Since income will increase, there will be an increase in the demand for money, so Option D is incorrect. There may be an *increase* in the inflation rate if the increase in aggregate demand is sufficient to cause demand-pull inflation, so Option B is incorrect.

If the government is increasing its borrowing it will have to offer increased interest rates on its bonds. This will increase interest rates generally and therefore may cause a reduction in private sector consumption and investment and spending. Therefore Option C is correct. [1½]

20.3 Option D.

A *pure fiscal policy* is one that does not involve any change in the money supply, as the required borrowing is obtained from the non-bank private sector. It will therefore result in a greater increase in interest rates and a greater reduction in private sector investment and consumption than if the money supply was increased (by borrowing from banks).

All else being equal, flatter money supply curves and liquidity preference (money demand) curves will lead to a smaller increase in interest rates and hence less crowding out. Likewise, the less sensitive investment is to interest rates, the less it will be crowded out by a given increase in interest rates. [1½]

20.4 (i) *Automatic fiscal stabilisers*

Automatic fiscal stabilisers (AFS) are the forms of government spending and taxes that adjust automatically to the state of the economy (without the government taking any action) and reduce the size of fluctuations in national income. [1]

When the economy is in recession, *ie* GDP is falling, firms' profits and households' incomes will decrease, resulting in a decrease in tax revenues. In addition, unemployment will be rising, leading to a rise in the value of unemployment benefit being paid. [1]

The result is that net taxes (*ie* tax revenues less transfers) will *decrease*, which will, by itself, tend to increase aggregate demand. Consequently, the economy will contract more slowly and by a smaller amount than would be the case in the absence of AFS. [1]

[Total 3]

(ii)   ***Stabilising effect arising from a change in monetary conditions***

In the event of a recession, the demand for money, *eg* for transaction and precautionary
purposes, will decrease.   [½]

This will tend to lead to a reduction in the level of interest rates …   [½]

… which will lead to an increase in borrowing by firms and households to fund increased spending
on investment and consumption.   [½]

However, in practice, this stimulative effect may be quite weak, as, if firms and households are
pessimistic about future economic prospects, their spending is likely to be relatively insensitive to
interest rates.   [1]

Consequently, instead of borrowing to spend more, they may choose to save and/or pay off
existing debts, so as to improve their financial well-being.   [½]
                                                                              [Total 3]

20.5   *Tax multiplier is one less than the government expenditure multiplier*

To see this, suppose that government spending is increased by ΔG and the marginal propensity
to consume domestic products is mpc_d. Then the increase in aggregate demand will be ΔG in
Year 1, $\Delta G \times mpc_d$ in Year 2, $\Delta G \times mpc_d^2$ in Year 3 and so on indefinitely. So, the overall increase
in GDP will be:

$$\Delta Y = \Delta G \left(1 + mpc_d + mpc_d^2 + mpc_d^3 + mpc_d^4 + ...\right) \qquad (1)$$

If, instead, taxation is cut by the same amount, ie $\Delta T = \Delta G$, then net-of-tax income will increase
by ΔG. However, as part of the extra income is saved or spent on imports, the increase in
aggregate demand in Year 1 will be just $\Delta G \times mpc_d$. So, in Year 2 it will be $\Delta G \times mpc_d^2$, in Year 3 it
will be $\Delta G \times mpc_d^3$ and so on indefinitely. So, the overall increase in GDP here will be:

$$\Delta Y = \Delta G \left(mpc_d + mpc_d^2 + mpc_d^3 + mpc_d^4 + ...\right)$$

which is the same as (1) above, except that the "1" in the bracket is missing.

Consequently, the tax multiplier must be equal to the government expenditure multiplier less
one.

20.6   (i)   *Fiscal policy*

Fiscal policy is the use of government spending and/or taxes to influence aggregate demand.   [½]

An *expansionary* fiscal policy involves increasing government spending and/or cutting taxes,
whereas a *deflationary* fiscal policy involves cutting government spending and/or increasing
taxes.   [½]

(ii)   ***Main roles for fiscal policy in practice***

The main roles for fiscal policy in practice are:

1.   to influence *aggregate demand*.   [½]

         This might be as part of a *fine-tuning policy*, *ie* a demand-management policy to smooth
         out cyclical fluctuations in the economy and to keep output gaps to a minimum.   [1]

         For example, in the event of demand-pull inflationary pressures in the economy,
         government spending might be reduced and/or taxes increased to reduce aggregate
         demand and hence the extent of the boom.   [1]

         It is also used to remove any severe inflationary or deflationary gaps.   [½]

         For example, many governments undertook very large expansionary fiscal policies,
         ie increasing government spending and/or reducing taxes to combat the global recession
         in 2008-09.   [1]

2.   to influence *aggregate supply*.   [½]

         For example, the government could increase its expenditure on infrastructure, education
         and training and/or R&D.   [½]

         The aim here could be to increase potential output and/or reduce the natural level of
         unemployment.   [½]

                                                                                    [Maximum 5]

20.7   (i)   ***The use of expansionary fiscal policy***

Fiscal policy is the use of government spending and taxation to influence the level of aggregate
demand in the economy.   [½]

In order to expand economic activity in the short run, the government could implement an
expansionary fiscal policy, *ie* an increase in government spending and/or a reduction in
taxation.   [1]

Government spending is an injection into the circular flow of income and so an increase in
government spending would cause national income to rise by a multiple of the increase in
injections.   [1]

The greater the marginal propensity to consume domestically produced goods, the greater the
multiplier effect on income.   [½]

This initial injection might be sufficient to pump prime the economy by increasing confidence and
causing investment and financial accelerator effects.   [1]

A reduction in taxation could also be used to increase GDP, however, it would be less effective in
stimulating aggregate demand since only a proportion of the tax cuts would be spent on
domestically produced goods.   [1]

                                                                                       [Total 5]

(ii)   *Potential problems*

The potential problems that may undermine the effectiveness of expansionary fiscal policy include:

- the difficulties in predicting the size of the effect on national income because of:
    - the unknown size of crowding out effects (though if the money supply is expanding too, this will be less of a problem)
    - difficulties in estimating the marginal propensity to consume domestically produced goods and hence the multiplier
    - difficulties in predicting the investment and financial accelerator effects
    - random shocks to the economy, *eg* an oil price increase   [2]

- timing difficulties arising because of the time taken:
    - to decide that action is required
    - to determine the required action
    - to implement the changes
    - for the changes to work their way through the economy via the multiplier and the accelerator effects
    - for consumption to respond to changes in taxation.   [2]

Therefore expansionary fiscal policy might be less effective than anticipated in increasing aggregate demand and GDP. Conversely, if it is more effective than anticipated, it might succeed in stimulating aggregate demand too much, so causing demand-pull inflation and also a worsening balance of payments position.   [1]

If greater inflation results, then it may lead to expectations of higher inflation in the future.   [½]

Time lags could cause the policies to be *destabilising*. By the time the policies take effect, the original recession might have turned into a boom − in which case, these policies would accentuate the boom and cause demand-pull inflation.   [1]

[Maximum 5]

20.8   (i)   *The case for and against discretion*

Active intervention enables the government to respond appropriately to the *unpredictable shocks* that continually affect the economy.   [1]

Keynesian economists argue that without discretionary stabilisation policies, the uncertainty caused by unpredictable fluctuations would be damaging to employment, investment and long-term growth.   [1]

Keynesians also argue that attempting to keep to inflation or monetary targets will result in excessive fluctuations in interest rates, which will discourage investment. Also, any failures to keep to targets will result in a reduction in confidence and an increase in instability.   [1]

Most economists agree that the expansionary monetary and fiscal policies adopted by governments helped to prevent an even deeper global recession in 2008-9.   [1]

However, demand-management policies are unpredictable in terms of magnitude and timing. [½]

In particular, it is impossible to predict the size of the changes in economic variables in response to changes in policy levers, such as government spending and interest rates. [1]

Furthermore, the delays in implementing policy and for the policy to work through the economy mean that the resulting time lags could make such policies destabilising. (However, these problems may decrease as understanding develops and forecasting techniques improve.) [1]

In addition, governments may attempt to manipulate the economy to achieve political popularity.
[½]

This usually involves a loosening of fiscal policy and hence a tendency towards a *deficit bias*. [½]

In taking such action, they lose credibility, create uncertainty and may engender higher inflationary expectations and therefore an *inflation bias*. [½]

[Maximum 6]

(ii) *The case for rules*

The delegation of monetary policy to central banks is an attempt to de-politicise and increase the credibility of economic policy. [1]

Setting and sticking to rules, *eg* with regard to inflation, will influence people's *expectations* that inflation will be lower, making an inflation target easier to attain. [1]

Also, having a stable monetary and fiscal framework makes it easier for firms to make long-term planning decisions leading to more investment and growth. [1]

If firms are not protected from adverse market conditions by discretionary policy, they may be encouraged to improve their efficiency and adopt less risky policies (*eg* banks). [1]

Ideally, different countries will follow mutually consistent rules, which will make the targets easy to attain and should lead to more stable exchange rates, hence improving the potential for world growth. For example, many countries have an inflation target of approximately 2-3%. [1]

[Total 4]

21

Exchange rate policy

Syllabus objectives

3.6 Discuss what is meant by the balance of payments and how exchange rates are determined.

4. Discuss the advantages and disadvantages of fixed and floating exchange rates.

5. Explain how governments and/or central banks seek to influence the exchange rates.

6. Describe the implications of such actions for other macroeconomic policies and for business.

Core Reading

Chapter 25 (Sections 1, 2, 3 and 4, and Appendix)   *Pages 786–821*
    (excluding the effects of shocks under fixed exchange rates subsection on pages 797–798)

0   Introduction

Exchange rates were introduced in Module 13 on *international trade and payments*. Recall that the *exchange rate* is the rate at which one currency can be traded for another on the foreign exchange market.

This module looks at exchange rates in detail and discusses the various possible exchange rate systems, or regimes. More specifically, it describes the operation of the two extremes of:

1.   a *(totally) fixed exchange rate regime* – in which the central bank intervenes directly to maintain the exchange rate at a fixed level, typically against another currency or a basket of other currencies

2.   a *free-floating exchange rate regime* – in which there is no central bank intervention and the exchange rate is free to vary according to supply and demand in the currency markets

and looks at the pros and cons of each.

In practice, a number of *intermediate systems* can be, and have been, used. Under these, exchange rates are partly left to the market, but are subject to some government intervention to influence the level of the exchange rate.

Most of this material appeared previously in Subject CT7, where it was examined regularly.

The final two sections of the module (which are new to Subject CB2):

•   look at the exchange rate systems that have been used in practice since the Second World War

•   use an extended *IS-LM* model to analyse the effectiveness of fiscal and monetary policies under fixed and floating exchange rates.

1   Alternative exchange rate regimes

1.1   What's included in this section

- Policy objectives: internal and external

- Nominal and real exchange rates

- Alternative exchange rate regimes

- Correction under fixed exchange rates

- Correction under free-floating exchange rates

- Intermediate exchange rate regimes

1.2   Guidance

This section looks at various exchange rate regimes and their relationship to the balance of payments. (Recall that the relationship between floating exchange rates and the balance of payments was touched on in Module 13.)

While we need to know about the other types of exchange rates, the two extremes of completely fixed and freely floating exchange rates are the ones that were examined frequently in Subject CT7.

It is also important to understand the distinction between the nominal exchange rate and the real exchange rate.

Note that:

- Figure 25.2 provides a useful summary of the effects of different 'shocks' on the internal balance and the narrow external balance (the current account surplus or deficit).

- Box 25.1 relates the balance of trade to the public sector budget balance (which was introduced in the previous module).

- Box 25.2 discusses whether the UK's balance of payments deficit is a cyclical problem or a long-run trend.

- On page 787, there is reference to the *DAD-DAS* model. *This model is covered in Chapter 20, Section 3, and is not in Core Reading*.

1.3   Reading

Task	*√when completed*
Read Chapter 25, pages 787–797.	☐

1.4   Checklist

Task	√ when completed
Ensure that you can:	
• define the following key terms:	
– internal policy objectives	☐
– external policy objectives	☐
– internal balance	☐
– external balance	☐
– exchange rate regime	☐
– real exchange rate	☐
– totally fixed exchange rate	☐
– freely floating exchange rate	☐
– intermediate exchange rate regimes	☐
– sterilisation	☐
– expenditure changing (reducing) from a contraction: the income effect	☐
– expenditure switching from a contraction: the substitution effect	☐
– expenditure switching from depreciation: the substitution effect	☐
– expenditure changing (increasing) from depreciation: the income effect	☐
– adjustable peg	☐
– devaluation	☐
– revaluation	☐
– managed floating	☐
– crawling peg	☐
– joint float	☐
– exchange rate band	☐
• discuss the potential conflicts between the attainment of internal and external balance	☐
• discuss the relationship between the balance of trade and the public finances	☐
• distinguish between nominal and real exchange rates and state a formula relating the two	☐
• explain the need for central bank intervention in the currency markets under a fixed exchange rate regime.	☐

Task	√ *when completed*
Continued	
Ensure that you can:	
• discuss the effect on the money supply of central bank intervention in the currency markets under a fixed exchange rate regime	☐
• discuss, with reference to expenditure changing (reducing) and expenditure switching, how to correct a persistent balance of payments deficit under a fixed exchange rate regime	☐
• discuss, with reference to expenditure switching and expenditure changing (increasing), the correction of a balance of payments deficit under a free-floating exchange rate regime	☐
• discuss the different types of intermediate exchange rate regimes.	☐

1.5 Questions

Question

Explain the difference between internal balance and external balance (according to the narrow definition) and give an example of the possible conflict between achieving them both.

Solution

Internal balance is where the equilibrium level of national income is at the desired level, *eg* at the potential level of output.

External balance (according to the narrow definition) is where the current account of the balance of payments is in balance (*ie* where exports, imports, net income flows from abroad and net current transfers sum to zero) and hence the financial and capital accounts also sum to zero.

Suppose the economy is currently in recession, with output below its potential level. The government may then choose to implement an expansionary fiscal policy, *eg* by increasing government spending and/or cutting taxes, in order to increase output (so as to restore internal balance) and employment.

However, if successful, the increased national income will likely lead to consumers buying more imports from abroad, leading to a current account deficit.

This issue may be exacerbated if higher domestic demand leads to inflation that increases export prices making exports less competitive.

Question

All else being equal, the real exchange rate will increase if:

A   export prices fall by less than import prices.
B   export prices rise by less than import prices
C   the nominal exchange rate falls.
D   export prices fall while import prices are unchanged.

Solution

Option A. The real exchange rate is defined as:

$$\text{real exchange rate} = \text{nominal exchange rate} \times \frac{\text{export prices}}{\text{import prices}}$$

NB Changes in the real exchange rate measure changes in the competitiveness of a country's exports.

Question

Suppose the UK pound is fixed in value against other currencies and that supply of UK pounds on the currency market exceeds the demand for UK pounds.

Describe how and why the Bank of England would intervene and the effect this would have on the UK money supply and interest rates, both with and without sterilisation.

Solution

A surplus of UK pounds being sold on the currency market would result in downward pressure on the value of the pound. In order to maintain the fixed exchange rate, the Bank of England would need to intervene in the currency market by buying up the excess pounds. It would fund this by selling foreign currency reserves.

In the absence of sterilisation, this would have the effect of withdrawing pounds from circulation, so *reducing* the money supply, which in turn would lead to an *increase* in UK interest rates.

However, if the Bank of England wanted to avoid these monetary effects, then it could counter them with *sterilisation*. In other words, it could use open market operations (or other monetary measures) to expand the money supply and so prevent it falling and interest rates rising.

Question

An adjustable peg is defined as:

A   a system where the government allows a gradual adjustment of the exchange rate.

B   a system where the exchange rate is fixed for a period of time but may be devalued if a deficit becomes substantial, or revalued, *ie* increased, if a surplus becomes substantial.

C   where the government repegs the exchange rate at a lower level.

D   where a currency is allowed to float between an upper and lower exchange rate.

Solution

Option B. This is the definition of an adjustable peg.

Options A and C define a *crawling peg* and a *devaluation* respectively. Option D describes an *exchange rate band*.

2   Fixed exchange rates

2.1   What's included in this section

- Causes of longer-term balance of payments problems under fixed exchange rates

- Advantages of fixed exchange rates

- Disadvantages of fixed exchange rates

2.2   Guidance

The main body of the text first looks at four of the *causes of long-term balance of payment problems* under fixed exchange rates, namely:

1.   different inflation rates between countries

2.   different growth rates between countries

3.   the income elasticity of demand being higher for imports than for exports

4.   long-term structural shifts that influence the demand for, and supply of, imports and exports, *eg* the emergence of new trading blocs.

It then considers the *advantages and disadvantages* of fixed exchange rates. These were tested frequently in Subject CT7. The key advantage is *certainty*, which makes international trade and international investment less risky. Some of these *advantages and disadvantages* of fixed exchange rates are counterpoints to the disadvantages and advantages of free-floating exchange rates discussed in the following section.

The disadvantages of fixed exchange rate regimes highlighted by new classical and Keynesian economists are also discussed. Both schools are critical of fixed exchange rates, but for different reasons.

Box 25.3 is particularly useful as it brings together fiscal and monetary policy and examines their effectiveness under a fixed exchange rate system. Note that there is an equivalent box (Box 25.6) in the following section that considers a floating exchange rate system.

2.3   Reading

Task	√*when completed*
Read Chapter 25, pages 797–801 (excluding the 'effects of shocks under fixed exchange rates' subsection on pages 797-798).	☐

2.4   Checklist

Task	√**when completed**
Ensure that you can:	
• define the following key term:	
– international liquidity	☐
• discuss the effectiveness of monetary and fiscal policies under fixed exchange rates	☐
• describe the four causes of long-term balance of payment problems under fixed exchange rates	☐
• explain the four advantages of fixed exchange rates	☐
• explain the two new classical criticisms of fixed exchange rates	☐
• discuss the four problems with fixed exchange rates identified by Keynesian economists.	☐

2.5   Questions

Question

Outline four long-term structural changes that might lead to long-term balance of payments problems under fixed exchange rates.

Solution

1. *Trading blocs may emerge* that erect tariffs and quotas, making it trickier to export to the members of the trading bloc.

2. *Countries may exercise more monopoly power.* For example, OPEC might use its power to increase oil prices, so increasing the cost of imported oil for other countries.

3. *Countries may develop substitutes for imports*, reducing their demand for the exports of other countries.

4. *Countries may change the nature and quality of their products,* increasing their exports and reducing those of other countries.

Question

Explain the four potential advantages of fixed exchange rates.

Solution

The potential advantages of fixed exchange rates are:

1. *certainty*, as currency risk is removed from international trade and investment, which should encourage them both, leading to higher international growth

2. *little or no speculation*, as provided the rate is fixed and people believe it will remain so, there is no scope for speculation

3. the *automatic correction of monetary errors*. For example, if the money supply expands too quickly, the resulting lower interest rates and extra aggregate demand will lead to a balance of payments deficit. In order to correct this, the central bank must either buy the domestic currency, causing the money supply to fall, or raise interest rates, either of which will correct the oversupply of money.

4. *preventing the government from pursuing 'irresponsible' macroeconomic policies*. For example, suppose the government recklessly increased aggregate demand in order to increase incomes and employment so as to increase its popularity. Then the resulting balance of payments deficit would force it contract the economy again (unless it instead introduced import controls).

Question

Which of the following is a Keynesian criticism of fixed exchange rates?

A   Balance of payments deficits may force the government to pursue contractionary policies.
B   They reduce the effectiveness of monetary policy.
C   They require intervention in the currency markets.
D   They result in uncertainty for international investors.

Solution

Option A. A key Keynesian criticism of fixed exchange rates is that faced by a balance of payments deficit, the government may need to reduce aggregate demand to reduce imports, with adverse consequences for output and employment. *(In practice, an alternative approach to reducing a deficit might be to impose restrictions on trade such as tariffs and quotas. However, these reduce trade and may be prohibited under World Trade Organisation rules.)*

Options B and C are new classical criticisms of fixed exchange rates. The *certainty* fixed exchange rates provide for international investors, which will encourage international trade, investment and growth, is a key *advantage* of fixed exchange rates.

3   Free-floating exchange rates

3.1   What's included in this section

- Floating exchange rates and the freeing of domestic policy

- Response to shocks under a floating exchange rate

- Speculation

- Advantages of a free-floating exchange rate

- Disadvantages of a free-floating exchange rate

- Conclusion (on fixed and floating exchange rates

3.2   Guidance

This section is similar to the previous one, but for free-floating exchange rates. As such, it is very important to know and understand the advantages and disadvantages of a free-floating exchange rate regime.

One key advantage of a free-floating exchange rate is that it will, in principle, adjust automatically to correct a balance of payments surplus or deficit. In fact, the *purchasing power parity (PPP) theory* suggests that over time (nominal) exchange rates should change to exactly offset differences in countries' inflation rates, so maintaining competitiveness (and keeping the real exchange rate constant). Box 25.4 provides a nice illustration of PPP in terms of the prices of Big Macs in different countries!

However, in practice, it is not this straightforward. For example, short-term exchange rate movements are heavily influenced by *speculation*, which can have the effect of either *stabilising* the exchange rate, or *destabilising* it and making it even more volatile. (Box 25.5 examines the reasons for the changes in the value of the euro since it was introduced in 1999.)

The advantages and disadvantages of a free-floating exchange rate are largely the opposites of those of a fixed exchange rate. The main advantages include the automatic correction of balance of payments disequilibria discussed above and also the greater freedom afforded to governments with regard to their choice of domestic macroeconomic policy. The main disadvantage is the *uncertainty* caused by currency fluctuations, often exacerbated by *speculation.*

In addition, Box 25.6 discusses why monetary policy is strong and fiscal policy weak under a free-floating exchange rate.

3.3   Reading

Task	√*when completed*
Read Chapter 25, pages 802–810.	☐

3.4 Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– purchasing power parity (PPP) theory	☐
– carry trade	☐
– exchange rate overshooting	☐
– forward exchange market	☐
• describe how, according to the PPP theory, relative inflation rates affect relative prices between countries	☐
• explain why high real interest rates and the carry trade may lead to the breakdown of the purchasing power parity theory (due to internal shocks)	☐
• describe how floating exchange rates may protect the domestic economy from world economic fluctuations (external shocks)	☐
• describe the exchange rate path to long-run equilibrium after a shock (in the absence of speculation)	☐
• explain the possible effects of stabilising and destabilising speculation on the exchange rate	☐
• explain the four advantages of free-floating exchange rates	☐
• explain the three disadvantages of free-floating exchange rates.	☐
• discuss the effectiveness of monetary and fiscal policies under free-floating exchange rates.	☐

3.5 Questions

Question

The purchasing power parity theory implies that if UK inflation is persistently lower than US inflation, then over time:

I   the UK pound will appreciate against the US dollar.

II   the real exchange rate between pounds and dollars will be unchanged.

III   the UK pound will depreciate against the US dollar.

A   I only

B   II only

C   I and II

D   II and III

Solution

Option C. The purchasing power parity (PPP) theory implies that if UK inflation is persistently lower than US inflation, then over time the UK pound will *appreciate* against the US dollar – Statement I. (This is because as UK exports become more competitive, demand for them will increase, leading to an increased demand for UK pounds.). In fact, PPP suggests the UK pound will appreciate so that the decrease in relative prices will be exactly offset by an increase in the value of the pound versus the dollar, so that the real exchange rate is unchanged – Statement II.

For example, if UK price fall by 10% relative to US prices, then the pound should rise by 10% in value against the dollar.

Question

Which of the following statements about free-floating exchange rates is NOT true?

A   They enhance the effectiveness of fiscal policy.
B   The associated uncertainty can be reduced using forward contracts.
C   Speculation can make them extremely volatile.
D   There is no need to hold reserves of foreign currency.

Solution

Option A. Having a free-floating exchange rate *diminishes* the effectiveness of fiscal policy. For example, suppose the government increases its spending in order to increase aggregate demand and output. Assuming a fixed money supply schedule, the resulting increased demand for money will cause interest rates to rise, leading to financial inflows, and a rise in the exchange rate. This will make exports less competitive, so reducing net exports and hence aggregate demand.

Options B and C are both true statements, although bear in mind that speculation can also be stabilising. Option D is true because the exchange rate automatically changes to correct balance of payments disequilibria without the need for government intervention.

Question

Describe the four potential advantages of free-floating exchange rates.

Solution

1.   Balance of payments surpluses and deficits are *corrected automatically* (by movements in the exchange rate) without the need for central bank intervention.

2.   There is *no problem with a shortage of international liquidity and reserves*. This is because there is no need for central bank intervention and hence no need to hold foreign currency reserves.

3.   They provide some *insulation from external economic shocks*. For example, suppose that there is world recession resulting in lower demand for exports and a consequent decrease in aggregate demand. The resultant fall in the exchange rate will make exports more competitive, so boosting exports and reducing the impact of the world recession on domestic demand.

4.   Governments have greater *freedom to choose the appropriate domestic macroeconomic policy*, as any effects on the balance of payments (*eg* due to increased demand sucking in more imports) will be automatically corrected by movements in the exchange rate.

4   Exchange rate systems in practice

4.1   What's included in this section

- The adjustable peg system: 1945-73

- Managed floating

- Problems with managed floating since 1972

- The volatility of exchange rates

4.2   Guidance

This section looks at how exchange rates have operated in practice since 1945.

It first discusses the *Bretton Woods* system of fixed exchange rates, which was managed by the *International Monetary Fund* (*IMF*). Under this system, the US dollar was fixed against the price of gold and most other currencies were fixed against US dollars. The experience of this system highlights some of the advantages and disadvantages of fixed exchange rates described previously. Eventually, problems with balance of payments disequilbria and international liquidity led to the collapse of the system in 1972-73.

Since then, a system of *managed floating* has operated for most major currencies. This allows exchange rate adjustments to economic shifts, with occasional central bank intervention to stabilise rates. However problems have arisen, particularly with:

- the increasing *volatility of exchange rates*

- *conflicts* between stabilising exchange rates and meeting domestic objectives.

Box 25.7 describes the experience of sterling since the 1990s, whilst Box 25.8 discusses the influence of PPP on exchange rates and suggests that whilst it doesn't explain short-run movements, it has some validity in the long run.

This material is new to Subject CB2.

4.3   Reading

Task	*√when completed*
Read Chapter 25, pages 810–817.	☐

4.4 Checklist

Task	√ *when completed*
Ensure that you can:	
• define the following key terms:	
– Bretton Woods system	☐
– J-curve effect	☐
• describe the operation of the Bretton Woods system	☐
• outline the contribution of the Bretton Woods system to world growth	☐
• describe the problems of adjustment to balance of payments disequilibria and international liquidity that led to the collapse of the Bretton Woods system	☐
• describe the operation of the managed floating system since the early 1970s	☐
• describe the problems with managed floating since 1972	☐
• outline the reasons for the increased volatility of exchange rates.	☐

4.5 Questions

Question

Which of the following has NOT contributed the increased volatility of exchange rates?

A   the use of inflation and money supply targets

B   the growth in information technology

C   increased currency speculation

D   the J-curve effect

Solution

Option D. The *J-curve effect* refers to the fact that a devaluation may initially cause a deterioration in the balance of payments before it subsequently improves (once trade has fully adjusted to the new lower exchange rate).

The use of inflation and money supply targets has resulted in larger interest rate changes, which have caused greater exchange rate fluctuations. The growth in information technology has made it much quicker and easier to make large international financial transfers. Increased currency speculation has led to huge increases in the trading of currencies.

Question

Describe three ways in which the Bretton Woods system contributed to high economic growth in the 1950s and 1960s.

Solution

1. *Exchange rates were fixed for a long period of time*, which reduced uncertainty and encouraged international trade and investment.

2. *Pegged exchange rates*, together with the management of the system by the International Monetary Fund, prevented governments pursuing irresponsible polices and helped bring about a harmonisation of polices that helped control inflation.

3. *Countries with severe deficits were allowed to devalue their currencies*, rather than being forced to use contractionary or protectionist policies.

5 Appendix: The open economy and *IS-LM* analysis

5.1 What's included in this section

- Analysis under a fixed exchange rate

- Fiscal policy under fixed exchange rates

- Monetary policy under fixed exchange rates

- Analysis under free-floating exchange rates

- Fiscal policy under floating exchange rates

- Monetary policy under floating exchange rates

5.2 Guidance

This section uses the *IS-LM* model introduced in Module 18 to analyse the effectiveness of fiscal and monetary policies under fixed and floating exchange rates. (Recall that this topic was discussed previously in Boxes 25.3 and 25.6.) In doing so, it introduces the *BP (balance of payments) curve*, which shows the combinations of interest rates (*r*) and national income (*Y*) corresponding to balance of payments equilibrium. This slopes *upwards* because whereas an increase in *r* will lead to a financial account surplus (due to inflows of money), a rise in *Y* will lead to a current account deficit (as imports increase). Consequently, a rise in one of *r* and *Y* must be offset by a rise in the other in order to maintain a balance of payments equilibrium.

The extended *IS-LM* model is then used to illustrate that under a *fixed* exchange rate:

- the effectiveness of an expansionary fiscal policy will either be reinforced or dampened, depending on whether the *BP* curve is flatter or steeper than the *LM* curve

- monetary policy alone will have no long-term effect on output and employment.

Conversely, the model suggests that under a *floating* exchange rate:

- the *BP* curve will shift upwards (downwards) if there is a balance of payments surplus (deficit) and hence an appreciation (depreciation) of the currency

- the effectiveness of an expansionary fiscal policy will either be reinforced or dampened, depending on whether the *BP* curve is steeper or flatter than the *LM* curve

- monetary policy will have a substantial effect on output and employment.

This material is new to Subject CB2.

5.3 Reading

Task	√*when completed*
Read Chapter 25, pages 817–821.	☐

5.4 Checklist

Task	√when completed
Ensure that you can:	
• describe the *BP* (balance of payments) curve, explain why it slopes upwards and the factors affecting its gradient	☐
• explain the effect on output of an expansionary fiscal policy under fixed exchange rates using the extended *IS-LM* model, when the *BP* curve is (i) flatter and (ii) steeper than the *LM* curve	☐
• explain the effect on output of an expansionary monetary policy under fixed exchange rates using the extended *IS-LM* model, when the *BP* curve is (i) flatter and (ii) steeper than the *LM* curve	☐
• explain movements in the *BP* curve under free-floating exchange rates	☐
• explain the effect on output of an expansionary fiscal policy under floating exchange rates using the extended *IS-LM* model, when the *BP* curve is (i) flatter and (ii) steeper than the *LM* curve	☐
• explain the effect on output of an expansionary monetary policy under free-floating exchange rates using the extended *IS-LM* model, when the *BP* curve is (i) flatter and (ii) steeper than the *LM* curve.	☐

5.5 Questions

Question

Which of the following statements is correct?

A   At points above the *BP* curve, the balance of payments is in surplus and the domestic currency will appreciate.

B   At points above the *BP* curve, the balance of payments is in deficit and the domestic currency will appreciate.

C   At points below the *BP* curve, the balance of payments is in surplus and the domestic currency will appreciate.

D   At points below the *BP* curve, the balance of payments is in deficit and the domestic currency will appreciate.

Solution

Option A. At points above the *BP* curve the balance of payments is in *surplus*. This means that there is an excess demand for the domestic currency and so it will *appreciate* in value.

Question

Using the extended *IS-LM* model, discuss the effectiveness of an expansionary fiscal policy under a fixed exchange rate system assuming that the *BP* curve is flatter than the *LM* curve.

Solution

An expansionary fiscal policy, involving an increase in government spending and/or a reduction in taxation, will shift the *IS* curve to the *right*. This is because for any given level of interest rates, there will be a higher level of equilibrium GDP than before.

However, the resulting increase in GDP will lead to an increase in money demand and hence in interest rates, *ie* the economy moves from (*r1*, *Y1*) to (*r2*, *Y2*) on the diagram below. As (*r2*, *Y2*) is above the *BP* curve, there is a balance of payments surplus – as the financial account surplus (due to incoming money flows attracted by the higher interest rates) more than offsets the current account deficit (due to higher imports).

This surplus will cause the domestic money supply to rise, as money flows into the economy, and hence the *LM* curve to shift to the *right*. This will further increase GDP (and the current account deficit) and will also reduce interest rates (and the financial account surplus) until a new equilibrium position is reached at (*r3*, *Y3*), where the goods market, the money market and the balance of payments are once more all in equilibrium.

So, the effect of the monetary change in the balance of payments is to reinforce the increase in GDP due to the expansionary fiscal policy, thereby making that policy more effective.
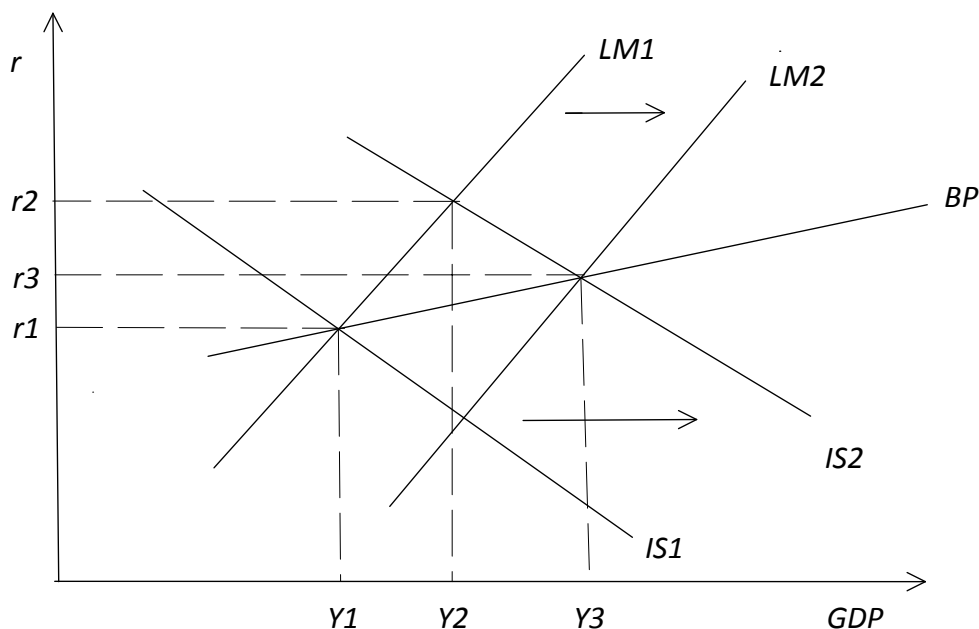
Module 21 Practice Questions

21.1   Complete each of the following statements with the appropriate phrase or word(s).

   (i)   The index of a country's export prices relative to the index of its import prices is known as
          the _____.   [1]

   (ii)   The theory that inflation rate differences between countries are the main reason for
          exchange rate movements between their currencies is known as the _____
          theory.   [1]

   (iii) The initial deterioration and later improvement in a country's account following a
          devaluation is known as the _____ effect.   [1]
                                                                                     [Total 3]

21.2   If the US Federal Reserve Bank wished to raise the exchange rate of the dollar against other
Exam style   currencies, then appropriate measures would include:

   I   selling dollars and buying yen on the foreign exchange market.
   II   recommending reduced tariffs on imported products.
   III   raising interest rates through its open market operations in the money market.

   A   I and II
   B   II and III
   C   I only
   D   III only   [1½]

21.3   Which of the following is TRUE?

Exam style   A   There is no automatic way of solving a balance of payments deficit in a floating exchange
                 rate system.

          B   Under a fixed exchange rate system, speculators have no role in the determination of the
                 exchange rate.

          C   Under a floating exchange rate system the government needs to hold substantial reserves
                 of gold and foreign currency.

          D   Under a fixed exchange rate system, the government might have to introduce policies to
                 solve balance of payments problems that will be economically inefficient.   [1½]

21.4   Suppose that the current exchange rate is $1.20 = £1. Suppose that over the next five years, UK
Exam style   prices increase by 20%, whereas US prices increase by 10%. According to the purchasing power
          parity theory, the exchange rate in five years' time should be:

          A $1.00 = £1.00
          B $1.10 = £1.00
          C $1.20 = £1.00
          D $1.32 = £1.00   [1½]

21.5   If the central bank has to intervene in the foreign exchange markets to prevent the domestic currency from depreciating, then its foreign exchange reserves will:

Exam style

A   decrease and the domestic money supply will rise.

B   decrease and the domestic money supply will fall.

C   increase and the domestic money supply will rise.

D   increase and the domestic money supply will fall.   [1½]

21.6   (i)   Explain how a free-floating exchange rate will automatically correct a balance of payments current account deficit with reference to the substitution effect.   [3]

Exam style

(ii)   Outline how the effectiveness of the substitution effect may be reduced by an income effect.   [4]

[Total 7]

21.7   Explain the main disadvantages of a fixed exchange rate system.   [8]

Exam style

21.8   Explain the main disadvantages of a free-floating exchange rate system.   [5]

Exam style

Module 21 Solutions

21.1   (i)   The index of a country's export prices relative to the index of its import prices is known as the <u>terms of trade index</u>.

    (ii)   The theory that inflation rate differences between countries are the main reason for exchange rate movements between their currencies is known as the <u>purchasing power parity</u> theory.

    (iii)   The initial deterioration and later improvement in a country's account following a devaluation is known as the <u>J-curve</u> effect.

21.2   Option D. Raising interest rates would increase deposits in the USA and the demand for dollars, which would increase the exchange rate.

Selling dollars would increase the *supply* of dollars and *reduce* the exchange rate. Reducing tariffs would *increase* imports and the *supply* of dollars, which would *reduce* the exchange rate.   [1½]

21.3   Option D. Options A and C are incorrect as floating exchange rates automatically correct a balance of payments deficit, which means there is no need for governments to hold reserves.

Option B is incorrect as if speculators believe the fixed rate cannot be maintained, their actions could cause a devaluation or a revaluation.

Under Option D, the government may need to decrease demand in the economy to reduce downward pressures on the exchange rate at a time when the economy would benefit from measures to increase demand, *eg* to increase GDP and employment. Alternatively, the government might introduce import controls, which prevent the most efficient allocation of the world's resources. So, Option D is true.   [1½]

21.4   Option B. According to purchasing power parity, the *nominal* exchange rate should change so as to exactly offset the change in the relative prices (so keeping the *real* exchange rate constant). So, the exchange rate in five years' time should be:

$$1.20 \times \frac{1.10}{1.20} = 1.10 \,, \; ie \; \$1.10 = £1.00$$

21.5   Option B. If the exchange rate is in danger of *depreciating*, there must be a decrease in demand for and/or an increase in supply of the currency. To prevent the depreciation, the central bank will have to buy the excess supply of domestic currency, which it will finance by selling foreign currency. Consequently, the domestic money supply and the country's foreign exchange reserves will both decrease.   [1½]

21.6 **(i)** ***How a free-floating exchange rate automatically corrects a current account deficit***

A *current account deficit* arises when exports are less than imports. [½]

This will result in a surplus of domestic currency being sold on the currency markets, as more domestic currency is exchanged in order to pay for imports priced in foreign currency, than domestic currency is purchased by people overseas in order to buy exports. [1]

The excess supply will lead to a *depreciation* in the value of the domestic currency. [½]

This will have the effect of making exports cheaper to people abroad (as they will have to hand over less foreign currency in exchange for exports priced in the domestic currency), so export volumes will increase. [½]

At the same time, imports will become more expensive in domestic currency terms (as more domestic currency will need to be handed over to buy imports priced in foreign currency), leading to a fall in imports. [½]

In principle, this process, which is referred to as the *substitution effect*, should continue until the current account is back in balance. [½]

[Maximum 3]

(ii) ***How the effectiveness of the substitution effect may be reduced by an income effect***

The increase in net exports leads to an increase in aggregate demand, which will lead to a multiplied increase in national income. [1]

This, in turn, will lead to an increased demand for goods and services, including those imported from abroad. This is known as the *income effect*. [1]

However, the increase in imports offsets the increase in net exports as a result of the substitution effect. [½]

It therefore reduces the effectiveness of the initial depreciation, meaning that a larger initial depreciation would have been required. [1]

In addition, higher domestic demand may lead to increased domestic prices. If, as a consequence, export prices increase, this will make them less competitive, so further reducing the effectiveness of the depreciation. [1]

[Maximum 4]

21.7 ***Main disadvantages of a fixed exchange rate system***

The lack of an automatic mechanism for solving a balance of payments disequilibrium means that the balance of payments acts as a *constraint on domestic policy*. [½]

Consequently, the government will be *unable to operate an independent domestic demand-side macroeconomic policy*. [½]

For example, interest rates must be used to ensure that the balance of payments balances and so the money supply must be varied in order to maintain the appropriate level of exchange rate.   [½]

Therefore, monetary policy cannot be used to try and achieve domestic economic policy objectives.   [½]

In addition, as the exchange rate cannot depreciate to cure a balance of payments deficit, *contractionary fiscal policy* might instead need to be used to reduce the level of domestic aggregate demand.   [½]

This would lead to a reduction in economic activity, with a consequent increase in unemployment.   [½]

Alternatively, and if allowed by the World Trade Organisation, *protectionist measures* such as tariffs and quota might be introduced, or the *exchange rate could be devalued*, neither of which are attractive options.   [½]

If countries with persistent balance of payments deficits all adopt deflationary policies, then a series of *competitive deflations* may result leading to a world recession.   [1]

The economy may find it *difficult to adjust to external shocks* such as a sudden increase in oil prices.   [½]

Reserves may be insufficient to maintain the exchange rate and the government may be forced to deflate the economy or devalue the currency.   [½]

In fact, if international trade is to grow, then there must be an expansion of acceptable world currencies, *eg* $s, €s, and £s, *ie* an *expansion of international liquidity*.   [½]

This is because the growth in both trade volumes and price levels will tend to lead to larger balance of payments surpluses and deficits.   [½]

However, too great a supply of these currencies could lead to world inflation …   [½]

… and the supply of each currency may be determined by domestic policy, rather than the needs of world trade.   [½]

Speculation may grow if speculators believe that the government will find it difficult to maintain a fixed rate.   [½]

For example, speculative selling of a currency will make a balance of payments deficit worse with the result that a devaluation may be forced upon the government.   [½]

New classical economists also view fixed exchange rates as undesirable intervention into foreign exchange markets.   [½]

[Maximum 8]

21.8 *Main disadvantages of a free-floating exchange rate system*

The exchange rate is unpredictable, which causes *uncertainty* for risk-averse international traders
and investors.   [1]

For example, if UK investors invest in a US company, then they cannot be sure of how much the
profits received in US dollars will be worth once converted back into UK pounds.   [½]

Consequently, international trade and investment may be lower than would otherwise be the
case, leading to a reduction in the growth rate of the international economy.   [½]

Free-floating exchange rates have become *increasingly volatile*, and hence unpredictable, over
recent decades.   [½]

This is due partly to the increased *speculative activity*, which has often proved to be
destabilising.   [½]

In addition, free-floating exchange rates can *reduce the effectiveness of expansionary fiscal
policy*.   [½]

For example, suppose the government increases its spending in order to increase aggregate
demand, so increasing output and employment. The resulting increased demand for money
raises interest rates, which may lead to an appreciation of the domestic currency and a
consequent fall in net exports and hence aggregate demand.   [1]

Finally, it can be argued that the freedom floating exchange rates provide with regard to domestic
macroeconomic policy results in a *lack of discipline* that allows governments to pursue
irresponsible inflationary policies, which do damage to the economy.   [1]

                                                                              [Maximum 5]

22

Global harmonisation and monetary union

Syllabus objectives

1.3   Analyse the recent macroeconomic history.

    4.   Discuss the aftershocks in Europe following the 2008 financial crisis.

    5.   Assess the stimulus-austerity debate and regulatory action after the 2008 crisis.

3.6   Discuss what is meant by the balance of payments and how exchange rates are determined.

    7.   Describe the purpose and examine the effectiveness of monetary union and single currencies, with reference to the European Economic and Monetary Union, the Exchange Rate Mechanism and the creation of a single currency.

Core Reading

Chapter 26 (Sections 1 and 2)   *Pages 824–838*

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0   Introduction

This module builds on the earlier ones on international trade and exchange rates and considers some of the wider issues facing the international economy that have arisen from globalisation.

In particular, the first section looks at how globalisation has resulted in much greater trade and financial links between countries. These have in turn resulted in *international business cycles* and contributed to greater *global economic instability*, as was evidenced by the international nature of the financial crisis of 2008. Possible solutions to reduce the extent of these problems include the *co-ordination and harmonisation of economic policy* between countries, as was seen in the international response to the financial crisis.

A prime example of an attempt to co-ordinate and harmonise economic policy between countries has been the establishment of *economic and monetary union* (EMU) and the adoption of the euro by a number of European Union countries. The second section of this module therefore summarises:

- the historical background to EMU and the euro, with reference to the exchange rate mechanism (ERM) and the Maastricht Treaty

- the arguments that have been put forward both in favour and against EMU.

It concludes with a brief discussion of some of the issues relating to the future of the euro.

Almost all of this material is new to Subject CB2.

1   Globalisation and the problem of instability

1.1   What's included in this section

- Interdependence through trade

- Financial interdependence

- International business cycles

- The need for international policy co-ordination

- The international harmonisation of economic policies

1.2   Guidance

This section first looks at the *trade and financial interdependencies* that link economies internationally. It links to the material on globalisation in Module 13. The growth of the interdependencies is illustrated in Figures 26.1 to 26.3 and Box 26.1.

International business cycles, in which the world economy experiences fluctuations in economic activity, are a direct consequence of the trade and financial interdependencies. The fact that countries face similar economic problems, such as the financial crisis of 2008/09, suggests that common international solutions to those problems may be appropriate.

The G8, the G20, the World Trade Organisation (WTO) and the International Monetary Fund (IMF) all have a role in developing international policy co-ordination. However, harmonisation is difficult to achieve in practice, particularly as different countries can experience very different economic circumstances, as is illustrated in Table 26.1.

1.3   Reading

Task	√*when completed*
Read Chapter 26, pages 824–830.	☐

1.4 Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– international trade multiplier	☐
– international harmonisation of economic policies	☐
– convergence of economies	☐
• discuss the extent and implications of the interdependence of economies through international trade	☐
• discuss the causes and implications of the financial interdependence of economies	☐
• outline the meaning and implications of international business cycles	☐
• explain the need for international policy co-ordination	☐
• explain the need for the international harmonisation of economic policies and the difficulties in achieving it.	☐

1.5 Questions

Question

Define each of the following terms:

(i)   international trade multiplier

(ii)   convergence of economies

(iii)   international harmonisation of economic policies.

Solution

(i)   The *international trade multiplier* refers to the effect on national income in Country B of a change in exports (or imports) of Country A.

(ii)   The *convergence of economies* occurs when countries achieve similar growth rates, inflation rates, budget deficits as % of GDP, balance of payment positions, interest rates *etc*.
NB These are regarded as the five main underlying causes of exchange rate movements.

(iii)   The *international harmonisation of economic policies* is where countries attempt to co-ordinate their macroeconomic policies so as to achieve common (economic) goals.

Question

State what is meant by financial interdependence and give three examples of it in practice.

Solution

Financial interdependence refers to the complex chain of interdependencies between financial institutions, financial systems and the wider economies in different countries. It has been caused by factors such as financial deregulation and innovation.

Examples

1.   Increased international financial flows mean that financial institutions such as banks typically have *significant liabilities* (*eg* bank deposits) to individuals and institutions in other countries.

2.   Large stocks of the *government bonds* issued to finance government borrowing, especially by western countries, are now held by foreign investors, including foreign governments. For example, China has been a huge buyer of US government bonds.

3.   The growth of *securitisation* has enabled financial institutions to increase their lending massively, *eg* mortgage lending by banks, by selling securitised bonds to raise capital from investors internationally.

Question

Outline six reasons why it is difficult to achieve the international harmonisation of economic policies.

Solution

NB The international harmonisation of economic policies requires countries to agree on common goals and to co-ordinate their macroeconomic policies to achieve those goals.

1.   Countries' *budget deficits and national debts positions may be very different* (as a proportion of GDP). So, in the event of a recession, some governments may be more willing and able to increase government spending than others.

2.   The interest rates needed to harmonise rates of monetary growth or inflation may fluctuate wildly, which may prove unacceptable to governments and/or central banks.

3.   *Monetary, inflation and exchange rate targets may need to be abandoned* in order to harmonise interest rates.

4.   Different *economies have different internal structures*, meaning that some countries might require interest or unemployment rates that they deem to be unacceptable in order to achieve harmonised inflation rates.

5.   *Economies differ in various ways (eg productivity growth, investment, mix of industrial sectors)* which mean that their net exports (and hence balance of payments position) will change over time even if countries attain similar inflation or growth rates.

6.   Some *countries may be unwilling to change their policies* to be similar to those of other countries. Domestic issues are more important to a country's leader than international issues, and therefore leaders will usually do what is best for their own countries. This runs the risk of a prisoners' dilemma, *eg* a trade war.

2   European economic and monetary union (EMU)

2.1   What's included in this section

- The ERM (exchange rate mechanism)

- The Maastricht Treaty and the road to the single currency

- The birth of the euro

- Advantages of the single currency

- Opposition to EMU

- The future of the euro

2.2   Guidance

This section looks at the euro and European economic and monetary Union (EMU). It begins by looking at the background to European EMU and the creation of the euro.

The euro was preceded by the *Exchange Rate Mechanism* (ERM). This was an example of the adjustable peg system described in Module 21. The euro itself was introduced in 1999, with euro banknotes and coins being introduced in 2002. In addition, the European Central Bank (ECB) was set up to operate monetary policy for the countries that adopted the euro.

In order to be able to adopt the euro, countries had to meet a series of eligibility criteria, with regard to inflation, interest rates, the budget deficit, the national debt and exchange rates. These were intended to ensure sufficient convergence between their economies.

The section next discusses the arguments for and against EMU and the euro. These overlap to some extent with those of fixed exchange rates discussed in the previous module. In addition, Box 26.2 discusses whether the eurozone is an *optimal currency area*.

The final sub-section discusses the future of the euro, with reference to:

- the ongoing Greek debt crisis

- the failure of eurozone economies to converge

- the sustainability of the public finances in the absence of a common fiscal policy.

2.3   Reading

Task	*√when completed*
Read Chapter 26, pages 830–838.	☐

2.4 Checklist

Task	√when completed
Ensure that you can:	
• define the following key terms:	
– economic and monetary union (EMU)	☐
– exchange rate mechanism (ERM)	☐
– currency union	☐
– optimal currency area	☐
– asymmetric shocks	☐
• describe the operation of the exchange rate mechanism (ERM), both in principle and in practice	☐
• describe the steps taken prior to the birth of the euro, including the five convergence criteria	☐
• describe the birth of the euro	☐
• explain the advantages of the single currency	☐
• explain the arguments against EMU in principle	☐
• explain the criticisms of the current design of EMU	☐
• discuss the future of the euro with reference to:	
– the Greek debt crisis	☐
– the single currency and the gains from trade	☐
– the euro and the fiscal framework.	☐

2.5 Questions

Question

Which of the following are advantages of the single currency?

I   increased competition and efficiency
II   lower inflation and interest rates
III   the adoption of a common monetary policy

A   I only
B   I and II only
C   I and III only
D   I, II and III

Solution

Option B. A key argument against the single currency is that the countries that use the euro lose the ability to have an independent monetary policy tailored to their own economic circumstances and problems. For example, as the economies of Germany and Greece are very different, the monetary policy that is suitable for Germany may be very unsuitable for Greece and vice versa.

Question

Outline the five convergence criteria that countries had to meet in order to adopt the euro.

Solution

1.   *Inflation* should be no more than 1.5% *pa* above the average of the three EU countries with the lowest inflation rates.

2.   *Interest rates* on long-term government bonds should be no more than 2% *pa* above the average of the three EU countries with the lowest inflation rates.

3.   The *budget deficit* should be no more than 3% of GDP at market prices.

4.   The *national debt* should be no more than 60% of GDP at market prices.

5.   The *exchange rate* should have been within the normal ERM bands for at least two years, with no realignments or excessive government intervention.

The practice questions start on the next page so that you can
keep the practice questions and solutions together for revision purposes.

Module 22 Practice Questions

22.1 Suppose the Federal Reserve Bank decides to raise interest rates in order to reduce inflation in the US. Explain how this is likely to affect aggregate demand and hence national income in the UK. [4]

Exam style

22.2 Country A has a current account deficit and so has decided to implement a contractionary fiscal policy. Discuss the possible conflict that will arise between the national interest of Country A and the international interest. [4]

Exam style

22.3 The possible arguments against the single currency within the EMU include:

Exam style

I   The eurozone isn't an optimal currency area.

II   The fiscal rules of the Stability and Growth Pact have not been adequately enforced.

III   It removes the ability of countries to depreciate their currencies in the event of recession.

A   I and II only

B   I and III only

C   II and III only

D   I, II and III [1½]

22.4 Which of the following statements is FALSE?

Exam style

A   The international harmonisation of economic policies is more difficult if countries experience divergent economic conditions.

B   The eurozone is an example of a currency union.

C   The impact of asymmetric shocks will be greater the lower is factor mobility between member countries.

D   The euro eliminates uncertainty due to exchange rate fluctuations. [1½]

22.5 (i)   Define optimal currency area. [1]

Exam style

(ii)   Explain why it can be argued that the eurozone isn't an optimal currency area. [5]

[Total 6]

22.6 Explain the arguments both in favour and against European economic and monetary union. [10]

Exam style

The solutions start on the next page so that you can
separate the questions and solutions.

Module 22 Solutions

22.1 If the Federal Reserve Bank raises US interest rates, it is likely to have three main effects on aggregate demand and national income in the UK:

1. If the interest rate hike causes aggregate demand and hence national income to fall in the USA, then demand for goods from the UK will fall, leading to a *fall* in UK aggregate demand and national income.   [1]

2. The US interest rate hike may lead to a rise in interest rates internationally including in the UK. If so, this will reduce investment and consumption in the UK, again leading to a *fall* in aggregate demand and national income in the UK.   [1]

3. Higher US interest rates will attract financial flows into the USA from other countries, including the UK, which will cause the US dollar to appreciate against the pound.   [1]

    This will, in turn, make UK exports to the US more competitive and UK imports from the US less competitive. The resulting increase in UK net exports will *increase* UK aggregate demand and national income.   [1]

Consequently, the overall effect of a rise in US interest rates will depend on the relative strengths of the above three effects.   [½]

[Maximum 4]

22.2 A contractionary fiscal policy involves Country A cutting government spending and/or increasing taxes, in order to reduce aggregate demand and hence the demand for imports.   [1]

In addition, the reduction in aggregate demand may also reduce domestic inflation making exports relatively cheaper compared to imports and hence more competitive, again resulting in an increase in net exports.   [1]

However, whilst solving Country A's deficit problem, this policy will lead to a fall in the exports of other countries, with an adverse affect on their aggregate demand and national income.   [1]

Consequently, these countries may seek to follow similar contractionary policies, resulting in a series of *competitive deflations* and an international recession.   [1]

In order to avoid this, it would instead be necessary for countries to *co-ordinate* their domestic policies, for example, by all agreeing to expand their domestic economies in order to generate world growth.   [1]

[Maximum 4]

22.3 Option D. All three alternatives are possible arguments against the single currency.   [1½]

22.4 Option D. The euro eliminates uncertainty due to exchange rate fluctuations within the eurozone, as members all use the same currency. However, it does not remove such uncertainty with respect to financial flows into and out of the eurozone, as the euro fluctuates in value against other currencies.   [1½]

22.5 (i) *Optimal currency area*

An *optimal currency area* is one that maximises the benefits of having a single currency relative to the costs of doing so. [½]

Consequently, changing the size of the area would not be optimal as it would increase the costs relative to the benefits. [½]

(ii) *Why the eurozone isn't an optimal currency area*

Labour is relatively immobile. This is due to language and cultural differences and the costs of moving from one country to another. [1]

Wage rates are relatively inflexible and so will not adjust as required to reflect labour shortages and surpluses in different parts of the eurozone. [1]

There are *structural differences* between the economies of the member states, *eg* with regard to their main industries and public finance positions, and so they might require different economic policies to achieve objectives and to respond to shocks, such as the financial crash. [1]

The *monetary transmission mechanisms* operate very differently in different member countries as they have different proportions of borrowing at variable interest rates and different proportions of consumer debt to GDP. [1]

The member countries have *different levels of exports* as a proportion of GDP to countries outside of the eurozone and so are affected differently by changes in the level of the euro. [1]

The Stability and Growth Pact and the Fiscal Compact c*onstrain the ability to use discretionary fiscal policy* to deal with domestic economic problems, except in times of severe difficulty. [1]

[Maximum 5]

22.6 The arguments in favour of European economic and monetary union include:

- the *elimination of the costs of converting currencies* incurred by international traders and investors operating within the single currency zone. The saving when the euro was introduced was only estimated to add a small amount to GDP. [1]

- the *increased competition and efficiency* resulting from more transparency in pricing and greater downward pressure on prices in high-cost firms and countries [1]

- the *elimination of exchange rate uncertainty* between the members of the eurozone, which has encouraged trade and investment between member countries. This has increased trade volumes, and hence the benefits of trade, and also economic growth. [1]

- *increased inward investment* into the single currency zone due to the creation of a large market without currency movements [1]

- *lower inflation and interest rates* due to the operation of an independent monetary policy by the European Central Bank, aimed at keeping inflation low. This in turn has encouraged further investment both by member countries and from outside the eurozone. [1]

The arguments against European economic and monetary union include:

- the *elimination of national currencies,* which means that a lack of competitiveness, *eg* due to high inflation or low productivity, cannot be corrected by a currency depreciation. This could result in persistent low output and high unemployment in certain countries.   [1]

- the *loss of separate monetary policies,* which means member countries cannot implement different monetary policies tailored to deal with the specific economic problems that they face   [1]

- the inability to adjust to *asymmetric shocks* that affect member countries to very different degrees and so require different responses, *eg* a financial crisis or an oil price shock   [1]

- the difficulty of operating the single currency when the *member economies are very divergent* in terms of economic growth, inflation, budget deficits (both size and structure of funding) and national debt   [1]

Particular criticisms of the way in which EMU has operate in the eurozone include:

- the *inflation-averse remit of the European Central Bank* and its *failure to respond proactively to the recession that followed the financial crisis*   [1]

- the *failure to enforce the fiscal rules* of the Stability and Growth Pact (budget deficit < 3% of GDP, national debt < 60% of GDP) rigidly (though some argue that fiscal policy could be used to transfer income between members and hence provide a buffer against asymmetric shocks).   [1]

[Maximum 10]

23

Summary of debates on theory and policy

Syllabus objectives

1.2   Assess the main strands of economic thinking:

- classical

- Marxian socialism

- neoclassical, Keynesian, neo-Keynesian and post-Keynesian

- monetarist

- Austrian.

1.3   Analyse the recent macroeconomic history.

4.   Discuss the aftershocks in Europe following the 2008 financial crisis.

5.   Assess the stimulus-austerity debate and regulatory action after the 2008 crisis.

Core Reading

Chapter 16 (Sections 1, 6 and 7)   *Pages 492–493, 510–516*

0   Introduction

We have arrived at the end of the course. In this final module, we aim to summarise the theories and policies of the main schools of thought that we have studied.

We set out the main views of the different schools of thought in Module 2 and the development of macroeconomic theory in Modules 16 and 17. It might be useful to revisit these modules now. The points made should now be familiar and the development of theories and policies over time should now be clearer.

In Section 1, we revisit the timeline included in Module 2 to show where in the course these schools of thought have been mentioned or discussed.

In Sections 2 to 4, we concentrate on macroeconomics, and in particular, we cover:

*   an overview of macroeconomic debates

*   the emerging consensus up until the financial crisis of 2008

*   the financial crisis and the search for a new consensus.

Although many of the theories studied were covered in previous Subject CT7 syllabuses, the development of theory and the search for a consensus are new to CB2.

1   A timeline – revisited

Adam Smith's Wealth of Nations 1776

Karl Marx's Capital 1867

J.M. Keynes' General Theory 1936

Milton Friedman's Chicago School 1960s and 70s

New classical economists, and increased influence of Austrian school from 1980s

1800

1900

2000

Other classical economists, eg Malthus, Ricardo, Say, late 18th/early 19th centuries

Neoclassical economists, eg Jevons, Walrus, late 19th/early 20th centuries

Neo-Keynesian and post-Keynesian schools from 1950s

New Keynesian school as a response to new classical school from 1980s

Classical	*Neoclassical*	*Keynesian*	*Monetarist and new classical*	*Austrian*
Smith: Free market (M1) Specialisation & absolute advantage (M13) **Malthus** (pessimistic about growth)**:** Population growth & diminishing returns (M6, M12) **Ricardo:** Comparative advantage (M13) **Say:** Say's Law (M16)	Microeconomic theory that is based on rational optimising behaviour: Supply & demand (M3 and M4) Demand theory (M5) Cost theory (M6) Most of theory of the firm (M7 & M8) Efficiency & market failure (M10)	**Keynes:** Unemployment (M12) Money market model (M15) General theory & policy (M16) **Followers:** Demand-side policy (M17 & M20) Phillips curve (M12) Hysteresis (M17) Interventionist supply-side policy (M19) Horizontal & upward-sloping *AS* curves (M16) *IS-LM* model *Hicks (neo-Keynesian)* (M18) Theories on market imperfections (*new Keynesians)* (M17)	**Friedman:** Quantity theory of money (revived) (M16, M17, M18) Accelerationist theory of inflation & vertical long-run *AS* and Phillips curves (M17) Supply-side policy (M17 & M19) **New classical:** Assumes rational expectations & continuous market clearing (M17) Vertical short-run *AS* & Phillips curves (M17) Real business cycle theory (M17) Market-orientated supply-side policy (M19)	Uncertainty & disequilibrium (M2) Free market & government failure (M2, M10) Distortion caused by loose monetary policy (M2) Market-orientated supply-side policy (M19)

2   The macroeconomic environment and debates

2.1   What's included in this section

- An overview of the macroeconomic environment and debates

2.2   Guidance

As a guide to the reading, the following might be of help:

- The reading given below gives a short history of the development of macroeconomic theory from the classical theory to the present day. It does not summarise the views of the different schools of thought. However, having studied all of the schools thoroughly, this is a good time to consider and compare them.

- The textbook tends to focus on the extremes of the political right (associated with those who support the free market, *eg* new classicals) and the political left (associated with those who believe that the free market fails and that government intervention is needed, *eg* Keynesians). However, in practice, there is a spectrum of opinion. For example, the right tends to support market-orientated supply-side policy, whereas the left tends to support interventionist supply-side policy. A 'third way' was adopted in the late 1990s, which involved a bit of both.

- The beliefs of the Austrian school are not easy to classify. Although they support the free market, their argument is based on different foundations from that of the new classicals. Whereas the new classical view is that people have access to information, form rational expectations and behave rationally, the Austrian view is that people and firms operate in conditions of uncertainty, people's preferences are complex and not necessarily rational in the conventional sense. However, they believe that the market reveals preferences, and that competition in a free market promotes welfare.

- In the checklist that follows the reading below, we have listed some of the topics that the various schools of thought have different views about, *eg* the flexibility of wages and prices. This material has all been covered in previous modules and we're just bringing it together here. To help to understand the whole spectrum of views on a range of issues, we have included some tables in the questions section.

- This material is new to Subject CB2.

2.3   Reading

Task	√when completed
Read Chapter 16, pages 492–493.	☐

2.4   Checklist

Task	√*when completed*
Ensure that you can:	

Ensure that you can:

- give a broad outline of the development of macroeconomic theory including:
    - classical period (1920s and 1930s)   ☐
    - Keynesian period (1940s to 1960s)   ☐
    - controversial monetarist period (1970s and 1980s)   ☐
    - consensus (1990s and 2000s)   ☐
    - post-crisis debates (2008 onwards)   ☐
- explain the different views on:
    - the flexibility of prices and wages   ☐
    - the flexibility of aggregate supply   ☐
    - the role of expectations (prices and output)   ☐
    - the importance of reducing budget deficits   ☐
    - the role of government in the economy   ☐
    - the importance of the short run and the long run   ☐
    - the closeness of the economy to full employment   ☐
    - the possibility of hysteresis   ☐
    - demand-side and supply-side policies for growth   ☐
    - market-orientated and interventionist supply-side policies.   ☐

2.5 Questions

Question

Complete the following table.

	Extreme Keynesian	*Moderate Keynesian – moderate monetarist*	*New classical*
Flexibility of prices and wages/ speed of market clearing	inflexible / slow		
Flexibility of aggregate supply/ shape of *AS* curve			inflexible / vertical
Expectations adjustments/ expectations of price or output?		quite slow – quite fast / mainly output – mainly prices	
Importance of reducing budget deficits			very important
Importance of the short run and long run	'In the long run we're all dead!'		
Closeness to full employment (or Y_p)			always close
Is hysteresis a problem?		might be – not a serious problem	
Polices for growth: demand-side or supply-side policies?		both – supply-side	
Supply-side policies: market-orientated or interventionist?	interventionist		

Solution

	Extreme Keynesian	*Moderate Keynesian – moderate monetarist*	*New classical*
Flexibility of prices and wages/ speed of market clearing	inflexible / slow	quite inflexible – quite flexible / quite slow – quite fast	flexible / very fast
Flexibility of aggregate supply/ shape of *AS* curve	flexible / horizontal *AS* up to Y_F	quite flexible – quite flexible in the short run but not in the long run / upward-sloping *AS* (more inelastic as Y_F approached) – vertical *AS* in long run	inflexible / vertical *AS* in short run and long run
Expectations adjustments/ expectations of price or output?	slow / output	quite slow – quite fast / mainly output – mainly prices *Monetarists assume adaptive expectations*	rapid / prices *New classicals assume rational expectations*
Importance of reducing budget deficits	not important	not very important – quite important	very important
Importance of the short run and long run	'In the long run we're all dead!'	short run more important – long run more important	little difference
Closeness to full employment (or Y_p)	could be far away and stay away a long time	could be far away – not far away	always close
Is hysteresis a problem?	always a potential problem	might be – not a serious problem	never a problem
Polices for growth: demand-side or supply-side policies?	demand-side	both – supply-side	supply-side
Supply-side policies: market-orientated or interventionist?	interventionist	mainly interventionist – mainly market-orientated	market-orientated

Question

Complete the following table to show the policies associated with particular schools of thought. (Tick the school or schools that support each policy.)

	Keynesian	Monetarist	New classical	Austrian
Reduce the power of unions to reduce disequilibrium unemployment				
Increase aggregate demand to reduce disequilibrium unemployment				
Reduce welfare payments to reduce equilibrium unemployment				
Offer retraining schemes for those who are structurally unemployed				
Offer information and demonstrate commitment to deal with inflation to reduce expectations of inflation				
Reduce money supply growth to reduce inflation				
Ensure sufficient aggregate demand to stimulate investment and growth				
Encourage growth by cutting corporation tax				
Laissez-faire				

Solution

	Keynesian	*Monetarist*	*New classical*	*Austrian*
Reduce the power of unions to reduce disequilibrium unemployment			√	√
Increase aggregate demand to reduce disequilibrium unemployment	√			
Reduce welfare payments to reduce equilibrium unemployment			√	√
Offer retraining schemes for those who are structurally unemployed	√			
Offer information and demonstrate commitment to deal with inflation in order to reduce expectations of inflation		√	√	
Reduce money supply growth to reduce inflation		√		√
Ensure sufficient aggregate demand to stimulate investment and growth	√			
Encourage growth by cutting corporation tax			√	√
Laissez-faire			√	√

The monetarist school is mainly known for its work on inflation, and, in particular the role of money and expectations in the inflationary process. These are the two points emphasised in the table. Although the main figures in the monetarist school, such as Milton Friedman, supported the free market (and therefore a laissez-faire approach), this was not their main interest, and is not represented in the table above.

3 An emerging consensus up to the crisis of 2008

3.1 What's included in this section

- The Great Moderation and a new mainstream consensus

- DSGE models – the new consensus macro model

- Constrained policy discretion

3.2 Guidance

Having revised the main schools of thought and compared them, we now turn to examining the way in which a consensus emerged in the period up to 2008.

This material is new to Subject CB2.

3.3 Reading

Task	√*when completed*
Read Chapter 16, pages 510–512.	☐

3.4 Checklist

Task	√*when completed*
Ensure that you can:	
• define the following key terms:	
– dynamic stochastic general equilibrium (DSGE) models	☐
– stochastic shocks	☐
– constrained discretion	☐
– inflation bias	☐
• describe the consensus of beliefs that emerged in the period known as the Great Moderation	☐
• explain the following elements of DSGE models:	
– dynamic	☐
– stochastic	☐
– general equilibrium	☐
– market imperfections and frictions	☐
• explain how central bank independence supports a policy of constrained discretion.	☐

3.5   Questions

Question

Which of the following are elements of the mainstream consensus that appeared before 2008?

I   new Keynesian view that markets work quickly and efficiently

II   new classical support for the real business cycle theory

III   the long-run trade-off between inflation and unemployment

A   I only

B   II only

C   I and II only

D   II and III only

Solution

Option B.

The mainstream consensus combined the new classical support for the real business cycle theory (Statement II) with the new Keynesian view that market imperfections prevent markets responding quickly and easily to shocks. (Statement I is therefore incorrect because the new Keynesian view is that markets do *not* work quickly and efficiently.)

According to the mainstream consensus view, there is *no* long-run trade-off between unemployment and inflation (therefore Statement III is incorrect), but deviations of output from its potential level could occur in the short run as a result of market imperfections.

Question

DSGE models are *dynamic* because:

A   the economy is hit by frequent random shocks.

B   individuals and firms make rational choices to maximise welfare.

C   rational choices evolve as events occur and rational expectations change.

D   a 'bottom up' approach is taken, in which the macroeconomic situation is analysed through the interaction of many micro markets.

Solution

Option C.

Choices are made in conditions of uncertainty, and as events occur, expectations change and rational choices change (so Option C is correct).

Option A refers to the *stochastic* element of these models. These stochastic shocks create uncertainty. Option B is an *assumption* of the models, but it doesn't explain the dynamic nature of the models. Option D explains why these models are known as *general equilibrium* models.

Question

Explain why it is thought that inflation bias can be eliminated by granting independence to the central bank.

Solution

Inflation bias is the excessive inflation that occurs if people raise their expectations of inflation. This often occurs if governments operate expansionary economic policies to increase output and reduce unemployment.

If the central bank is granted independence to determine interest rates in order to achieve an inflation target, the ability of governments to expand the economy will be restricted. If people have faith in the central bank's ability to achieve the inflation target, expectations of inflation will adjust to the target rate of inflation, so removing any inflation bias.

4 The financial crisis and the search for a new consensus

4.1 What's included in this section

- The financial crisis and its aftermath

- Fiscal expansion to fiscal austerity

- Debates about the state of macroeconomics

- Emergence of a new consensus

- Areas of general agreement

4.2 Guidance

This section should be an interesting read. It summarises the causes and effects of the financial crisis and the policy responses to it, much of which we have discussed before (in Modules 15, 20 and 22). It also discusses the re-opening of macroeconomic debate following the financial crisis and the search for a new consensus.

The search for a new consensus is new to Subject CB2.

4.3 Reading

Task	√ *when completed*
Read Chapter 16, pages 512–516.	☐

4.4　Checklist

Task	√ when completed
Ensure that you can:	
• define the following key terms:	
– sovereign debt crisis	☐
– post-Keynesians	☐
– paradox of debt (or of deleveraging)	☐
– downward causation	☐
• describe the reasons given by economists for the financial crisis	☐
• describe the fiscal policies adopted by many governments in response to the financial crisis and in its aftermath	☐
• discuss the stimulus-austerity debate after 2008	☐
• describe the views of the post-Keynesian economists who were never participants in the new classical – new Keynesian consensus	☐
• explain the paradox of thrift and the paradox of debt	☐
• describe the criticisms of the models used and assumptions made by the new classical – new Keynesian consensus	☐
• summarise areas of general agreement among economists.	☐

4.5　Questions

Question

Fill in the blanks in the following paragraph using the following words:

credit　　　　　capital　　　　　government　　　　　risks

boom　　　　　fail　　　　　little　　　　　moral hazard

Following the financial crisis, economists offered two contradictory explanations. Those on the political right believed that there had been too much _____ intervention, which had made banks take excessive _____ in the belief that they would not be allowed to _____ (a form of _____ _____). On the other hand, those on the political left believed that there had been too _____ regulation. If uncontrolled, banks tend to adopt looser lending criteria in a _____, which makes them vulnerable to an economic downturn. Banks should therefore be required to hold a minimum amount of _____. Some go further and suggest there should be a return to _____ controls (which many countries removed in the 1970s and 1980s).

Solution

Following the financial crisis, economists offered two contradictory explanations. Those on the political right believed that there had been too much <u>government</u> intervention, which had made banks take excessive <u>risks</u> in the belief that they would not be allowed to <u>fail</u> (a form of <u>moral hazard</u>). On the other hand, those on the political left believed that there had been too <u>little</u> regulation. If uncontrolled, banks tend to adopt looser lending criteria in a <u>boom</u>, which makes them vulnerable to an economic downturn. Banks should therefore be required to hold a minimum amount of <u>capital</u>. Some go further and suggest there should be a return to <u>credit</u> controls (which many countries removed in the 1970s and 1980s).

Question

Which of the following statements about the fiscal policy yo-yo is FALSE?

A   The fiscal policy yo-yo was observed in the UK and other countries in the aftermath of the financial crisis.

B   The fiscal policy yo-yo refers to the policy of fiscal expansion followed shortly by a policy of fiscal austerity.

C   The fiscal policy yo-yo was caused initially by the sovereign debt crisis.

D   The fiscal policy yo-yo resulted in rising and then falling budget deficits.

Solution

Option C.

The fiscal policy yo-yo was caused initially by the financial crisis, which was triggered by defaults on sub-prime debt. The severity of the financial crisis was understood immediately. Governments sought to stabilise the financial system and ensure there was sufficient aggregate demand in the economy, by adopting expansionary monetary and fiscal policies. The latter involved increasing government spending and reducing taxation, and therefore increasing the size of the budget deficit. Deficits were increased further by bank bailouts.

Within a year or two, the policies were reversed as governments became concerned about the size of the budget deficits. As a result of rising budget deficits, some countries, *eg* Greece, experienced a sovereign debt crisis. (Hence the sovereign debt crisis was a *consequence* rather than a *cause* of the fiscal policy yo-yo.) These countries found it difficult to sell government bonds because potential buyers were frightened that the government would be unable to repay the debt. These countries had to rely on bailouts from European funds and the IMF. A condition of such bailouts was the adoption of austerity measures to close the budget deficits.

Question

Criticisms of the mainstream consensus include the following:

I   assumptions of irrational behaviour
II   the paradox of aggregates
III   inadequate incorporation of the financial sector in their models

A   I only
B   I and II only
C   II and III only
D   I, II and III

Solution

Option C.

The complex models of the mainstream consensus were based on the assumption of *rational* behaviour (so Statement I is incorrect).

Also, the models were built 'bottom up' from micro foundations and therefore suffer from the paradox of aggregates, *ie* what works on a micro level might not work on a macro level (so Statement II is correct). For example, savings can help an individual buy an expensive item in the future but if everyone saves more, there will be less consumption and firms will produce less output and income will fall (*paradox of thrift*). Similarly, a person might wish to sell an asset in order to increase financial well-being, but if a large number of people do the same, then asset prices would fall and therefore aggregate net worth would fall (*paradox of debt*).

In the light of the financial crisis, economists now appreciate the importance of incorporating the financial sector including behavioural assumptions (so Statement III is correct).

Question

List five areas of agreement in macroeconomics.

(These are *general* areas of agreement. As we know there are still substantial differences at the extremes. See the tables in the questions in Section 2.)

Solution

Any five from the following:

1   In the short run, changes in aggregate demand can have a significant effect on output and employment.

2.   In the long run, changes in aggregate demand have a smaller effect on output and employment and a larger effect on prices.

3.   There is no simple long-run trade-off between inflation and unemployment.

4.   Expectations have an important effect on the economy.

5.   Excessive growth in the money supply will lead to inflation.

6.   The money supply is difficult to control, so it is easier to control inflation by controlling interest rates.

7.   In a deep recession, expansion of the money supply (*eg* quantitative easing) might be necessary.

8.   Supply-side policy is needed to stimulate long-term economic growth.

9.   Globalisation is impeding the ability of governments to control their macroeconomic positions.

The practice questions start on the next page so that you can
keep the practice questions and solutions together for revision purposes.

Module 23 Practice Questions

23.1 Which of these is associated with the Keynesian school?

Exam style

A   rational expectations

B   sticky wages

C   policy ineffectiveness proposition

D   real business cycle theory   [1½]

23.2 DSGE models generally assume:

Exam style

A   perfect competition

B   monopolistic competition

C   oligopoly

D   monopoly   [1½]

23.3 The post-Keynesian economists were never participants in the mainstream consensus prior to the financial crisis because:

Exam style

I   they are heterodox economists.

II   they do not believe the economy is self-correcting.

III   they believe that changes in levels of confidence change output and employment rather than prices.

A   I only

B   I and II only

C   II and III only

D   I, II and III   [1½]

23.4 Discuss the main arguments in the stimulus-austerity debate that took place in the post-2010 period.   [10]

Exam style

The solutions start on the next page so that you can
separate the questions and solutions.

Module 23 Solutions

23.1 Option B. Keynesians believe that wages might stay above the equilibrium wage rate in a recession, *ie* they would be sticky, especially downwards. Rational expectations, the policy ineffectiveness proposition and the real business cycle theory are all associated with the new classical school. [1½]

23.2 Option B. DSGE models typically assume monopolistically competitive goods and labour markets but models do vary so that economists can analyse the way in which imperfections affect the ways in which the economy responds to shocks. [1½]

23.3 Option D. *Heterodox economists* reject the assumptions of rational optimising behaviour that are inherent in the mainstream consensus. Post-Keynesians also reject the view that the economy is self-regulating and will always operate at or near its full potential. Like Keynes himself, they believe that confidence plays a large part in the determination of output and employment, and that, without an expansionary demand-management policy, an economy can stay in a recession for a long time. [1½]

23.4 *In response to the financial crisis of 2008 and the resulting recession, many governments experienced rising budget deficits partly as a consequence of the recession (ie lower tax receipts and higher government spending on benefits) and partly by design (ie as a deliberate attempt to stimulate aggregate demand (and, in some cases, to stabilise the financial system by bailing out the banks)). By 2009, the budget deficit in some countries had reached 10% or more of GDP. Some politicians and economists (mainly those on the political right) argued that the budget deficits now needed to be reduced sharply (a policy known as 'austerity'), whereas others (mainly those on the political left) argued that such austerity would make matters worse.*

Arguments in support of austerity measures included the following:

- High budget deficits would increase interest rates as each government has to compete with the private sector and other governments for available funds. This would depress (or crowd out) other components of aggregate demand in the economy. [1]

    Supporters of austerity measures in 2010 believed that a rapid deficit-reduction plan was needed to maintain the confidence of the financial markets and prevent upward pressure on interest rates. [1]

- A sovereign debt crisis could occur if investors did not wish to purchase government bonds for fear of default. [1]

    If the government was unable to sell its bonds, it might have to obtain loans from institutions such as the IMF, which might impose conditions on these loans, including the adoption of austerity measures. [1]

- Budget deficits increase the national debt of a country. Interest has to be paid on the national debt, so increasing it would mean that more taxes would have to be raised in future years to pay this interest. [1]

    The opportunity cost of this spending is the other services that might have been provided instead, such as improvements to schools, hospitals and transport. [1]

Arguments against austerity measures at this time included the following:

- Fears of interest rate rises from increased borrowing would not materialise if the money supply was allowed to rise. [1]

- Cutting government spending and increasing taxes when the economic recovery is fragile could endanger the recovery and send it into reverse. [1]

    Cuts in government spending might not be offset by rises in private spending. In fact, cuts in government spending and increases in taxation might reduce confidence in the economy and cause further cuts in consumption and investment. [1]

    Opponents of austerity in 2010 argued that a gradualist policy of deficit reduction would be less likely to endanger the recovery. [1]

- A fall in income, spending and employment would reduce tax receipts and increase government spending on benefits. So an austerity policy might *increase* rather than decrease the budget deficit. [1]

    Supporters of a gradual policy of deficit reduction argued that maintaining government support for a strong recovery would lead to higher tax receipts and lower government spending on benefits and hence an automatic reduction in the budget deficit. [1]

- Long-term growth prospects could be upset by cuts in government spending on infrastructure, research and development, education and training. [1]

- Cuts in public services could result in unintended consequences, *eg* an increase in crime, ill-health and homelessness, and are likely to particularly affect the poor and vulnerable who are unable to afford private equivalents. [1]

[Maximum 10]

End of Part 3

What next?

1.   Briefly **review** the key areas of Part 3.

2.   Ensure you have attempted some of the **Practice Questions** at the end of each module in Part 3. If you don't have time to do them all, you could save the remainder for use as part of your revision.

3.   Attempt **Assignment X3**.

Time to consider …

… 'revision and rehearsal' and 'rehearsal' products

ASET – This contains past exam papers with detailed solutions and explanations, plus lots of comments about exam technique. One student said:

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> *'Overall the marking was extremely useful and gave detailed comments on where I was losing marks and how to improve on my answers and exam technique. This is exactly what I was looking for – thank you!'*

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And finally ...

Good luck!

Subject CB2: Assignment X1

2019 Examinations

Time allowed: 3¼ hours

Instructions to the candidate

1. *Please:*

   – *attempt all of the questions, as far as possible under exam conditions*

   – ***begin your answer to each question on a new page***

   – ***leave at least 2cm margin on all borders***

   – *write in black ink using a medium-sized nib because we will be unable to mark illegible scripts*

   – *show full working to multiple-choice questions so that the marker can give helpful advice if you get any of these questions wrong*

   – *note that assignment marking is not included in the price of the course materials. Please purchase Series Marking or a Marking Voucher before submitting your script.*

   – *note that we only accept the current version of assignments for marking, ie you can only submit this assignment in the sessions leading to the 2019 exams.*

2. *Please **do not**:*

   – *use headed paper*

   – *use highlighting in your script.*

At the end of the assignment

If your script is being marked by ActEd, please follow
the instructions on the reverse of this page.

In addition to this paper, you should have available actuarial tables and an electronic calculator.

Submission for marking

You should aim to submit this script for marking by the recommended submission date. The recommended and deadline dates for submission of this assignment are listed on the summary page at the back of this pack and on our website at **www.ActEd.co.uk**.

Scripts received after the deadline date will not be marked, unless you are using a Marking Voucher. *It is your responsibility to ensure that scripts reach ActEd in good time*. If you are using Marking Vouchers, then please make sure that your script reaches us by the Marking Voucher deadline date to give us enough time to mark and return the script before the exam.

When submitting your script, please:

- complete the cover sheet, including the checklist

- scan your script, cover sheet (and Marking Voucher if applicable) and save as a pdf document, then email it to: ActEdMarking@bpp.com

- **do not submit a photograph of your script**

- **do not include the question paper in the scan.**

In addition, please note the following:

- Please title the email to ensure that the subject and assignment are clear
  eg 'CB2 Assignment X1 No. 12345', inserting your ActEd Student Number for 12345.

- The assignment should be scanned the **right way up** (so that it can be read normally without rotation) and as a single document. We cannot accept individual files for each page.

- Please set the resolution so that the script is legible and the resulting PDF **is less than 4 MB** in size.

- Do not protect the PDF in any way (otherwise the marker cannot return the script to ActEd, which causes delays).

- Please include the 'feedback from marker' sheet when scanning.

- Before emailing to ActEd, please check that your scanned assignment includes all pages and conforms to the above.

Subject CB2: Assignment X1

2019 Examinations

Please complete the following information:

Name:

ActEd Student Number (see Note below):

Note: Your ActEd Student Number is printed on all personal correspondence from ActEd. Quoting it will help us to process your scripts quickly. If you do not know your ActEd Student Number, please email us at ActEd@bpp.com.

Your ActEd Student Number is not the same as your IFoA Actuarial Reference Number or ARN.

Number of following pages: _____

Please put a tick in this box if you have solutions and a cross if you do not:

Please tick here if you are allowed extra time or other special conditions in the profession's exams (if you wish to share this information):

Time to do assignment
(see Note below):   _____ hrs _____ mins

Under exam conditions
(delete as applicable):   yes / nearly / no

Note: If you take more than 3¼ hours, you should indicate how much you completed within this time so that the marker can provide useful feedback on your progress.

Score and grade for this assignment (to be completed by marker):

MCQ	Q27	Q28	Q29	Q30	Q31	Q32	Q33	Q34	Q35	Q36	Q37	Q38	Total	
___ 39	_ 3	_ 3	_ 4	_ 3	_ 4	_ 4	_ 5	_ 4	_ 5	_ 6	___ 10	___ 10	____ 100	=_____%

Grade: A   B   C   D   E   **Marker's initials: _____**

Please tick the following checklist so that your script can be marked quickly. Have you:

[   ]   Checked that you are using the latest version of the assignment, *ie* 2019 for the sessions leading to the 2019 exams?

[   ]   Written your full name in the box above?

[   ]   Completed your ActEd Student Number in the box above?

[   ]   Recorded your attempt conditions?

[   ]   Numbered all pages of your script (excluding this cover sheet)?

[   ]   Written the total number of pages (excluding the cover sheet) in the space above?

[   ]   Included your Marking Voucher or ordered Series Marking?

Please follow the instructions on the previous page when submitting your script for marking.

Feedback from marker

Notes on marker's section

The main objective of marking is to provide specific advice on how to improve your chances of success in the exam. The most useful aspect of the marking is the comments the marker makes throughout the script, however you will also be given a percentage score and the band into which that score falls. Each assignment tests only part of the course and hence does not give a complete indication of your likely overall success in the exam. However it provides a good indicator of your understanding of the material tested and the progress you are making with your studies:

A = Excellent progress   B = Good progress   C = Average progress
D = Below average progress   E = Well below average progress

Please note that you can provide feedback on the marking of this assignment at:

www.ActEd.co.uk/marking

CB2 Multiple-Choice Answer Sheet

Please use this answer sheet to answer the multiple-choice questions. Instructions are given below. In addition, your marker will be happy to give you help on your approach to answering the multiple-choice questions. If you would like such comments, please include your workings on a separate sheet.

Instructions

Mark your answers by striking a line through the relevant box [—]. Do not mark outside the area. For example:

1	[—]	[B]	[C]	[D]

If you make a mistake, mark **X** through your wrong answer and mark the correct box with a [—]. For example:

2	[✗]	[B]	[—]	[D]

	A	B	C	D	*Marker use only*
1	[A]	[B]	[C]	[D]	
2	[A]	[B]	[C]	[D]	
3	[A]	[B]	[C]	[D]	
4	[A]	[B]	[C]	[D]	
5	[A]	[B]	[C]	[D]	
6	[A]	[B]	[C]	[D]	
7	[A]	[B]	[C]	[D]	
8	[A]	[B]	[C]	[D]	
9	[A]	[B]	[C]	[D]	
10	[A]	[B]	[C]	[D]	
11	[A]	[B]	[C]	[D]	
12	[A]	[B]	[C]	[D]	
13	[A]	[B]	[C]	[D]	
				Total:	

	A	B	C	D	Marker use only
14	[A]	[B]	[C]	[D]	
15	[A]	[B]	[C]	[D]	
16	[A]	[B]	[C]	[D]	
17	[A]	[B]	[C]	[D]	
18	[A]	[B]	[C]	[D]	
19	[A]	[B]	[C]	[D]	
20	[A]	[B]	[C]	[D]	
21	[A]	[B]	[C]	[D]	
22	[A]	[B]	[C]	[D]	
23	[A]	[B]	[C]	[D]	
24	[A]	[B]	[C]	[D]	
25	[A]	[B]	[C]	[D]	
26	[A]	[B]	[C]	[D]	
				Total:	

For Questions X1.1–X1.26 indicate on your answer sheet which one of the answers A, B, C or D is correct.

X1.1   What do economists mean by opportunity cost?

A   the value of the best alternative use for a resource
B   the equilibrium price for a scarce good
C   the revenue lost by missing an economic opportunity
D   the cost of allocating scarce resources   [1½]

X1.2   Points to the right of the production possibility curve show combinations of goods:

A   at which production is efficient.
B   at which production is inefficient.
C   that are unattainable given the current level of scarce resources.
D   that have zero opportunity cost.   [1½]

X1.3   In a free market economy, allocation decisions are made by:

A   the government and suppliers only.
B   consumers and suppliers only.
C   consumers, suppliers and the government.
D   consumers only.   [1½]

X1.4   The theory of surplus value was developed by:

A   Adam Smith.
B   David Ricardo.
C   Karl Marx.
D   John Maynard Keynes.   [1½]

X1.5   Which of the following events would shift the demand curve for Good X (a normal good) to the left?

A   an increase in the price of Good X
B   an increase in the price of a substitute good
C   an increase in the price of a complementary good
D   an increase in consumer income   [1½]

X1.6   Prices are most volatile when:

A   supply is elastic and demand inelastic.
B   supply is inelastic and demand elastic.
C   both supply and demand are elastic.
D   both supply and demand are inelastic.   [1½]

X1.7 Good X has an income elasticity of demand of -0.5 and a cross-price elasticity of demand with respect to Good Y of $+0.6$. Good X is:

A   a normal good and a substitute for Good Y.

B   an inferior good and a substitute for Good Y.

C   an inferior good and a complement for Good Y.

D   a normal good and a complement for Good Y.   [1½]

X1.8 Which of the following best illustrates the problems of moral hazard?

A   A woman becomes less concerned about locking her garage after increasing her buildings and contents insurance.

B   A man chooses not to insure his life because he has no dependants.

C   A person effects a long-term disability policy, shortly before taking a course of flying lessons.

D   A company offers cheaper life insurance to women than to men.   [1½]

X1.9 A consumer has £4.50 to spend on Mars and Twix chocolate bars. Mars chocolate bars cost 90 pence. Twix bars cost 90 pence. The relevant marginal utilities for the consumer are:

Quantity of Mars	Marginal utility of Mars	Quantity of Twix	Marginal utility of Twix
1	90	1	50
2	60	2	40
3	40	3	30
4	20	4	20
5	10	5	10

The optimal combination of Mars bars and Twix bars for the consumer to purchase is:

A   1 Mars bar and 4 Twix bars.

B   2 Mars bars and 3 Twix bars.

C   3 Mars bars and 2 Twix bars.

D   4 Mars bars and 1 Twix bars.   [1½]

X1.10 The principle of diminishing marginal utility of wealth implies that a risk-averse individual will be prepared to insure himself against an event:

A   even though the expected return is negative.

B   only if the expected return is zero.

C   only if the expected return is positive.

D   only if the event has a high probability of occurrence.   [1½]

X1.11   The endowment effect suggests that:

A   present payoffs are endowed with more appeal relative to future payoffs.

B   the value of a product is higher when it is owned than when it is being considered for ownership.

C   the utility from a product increases if other people buy it.

D   the value of a product increases if it is presented in an optimistic rather than a pessimistic way.   [1½]

X1.12   Marginal cost is:

A   the change in total costs when one more unit of labour is employed.
B   the change in average total costs when output is expanded by one unit.
C   the change in variable costs when output is expanded by one unit.
D   the same as marginal revenue.   [1½]

X1.13   At present, Company A is producing 10 units of Good X with quantities of labour and capital such that the marginal physical product of labour is 38 and the marginal physical product of capital is 14. The current cost of a unit of labour is $30, whereas the cost of a unit of capital is $10.

Assuming that both factors are subject to diminishing marginal returns, in order to produce 10 units of Good X as efficiently as possible, Company A should:

A   use less labour and more capital.
B   use more labour and less capital.
C   use more labour and more capital.
D   use less labour and less capital.   [1½]

X1.14   Which of the following is NOT a reason why economies of scale may exist?

A   indivisibilities
B   the division of labour
C   economies of scope
D   the increase in technological knowledge over time   [1½]

X1.15   Which of the following conditions produces normal profits?

A   average revenue = marginal revenue
B   average revenue = average cost
C   marginal revenue = marginal cost
D   average cost = marginal cost   [1½]

X1.16 A profit-maximising firm should keep producing in the short run:

A   when average fixed cost is above average revenue and average fixed costs are less than average variable costs.

B   when average revenue is above average variable cost.

C   when average revenue is above average fixed costs.

D   when total revenue is above total fixed costs and total fixed costs are less than total variable costs.   [1½]

X1.17 The market structure in which producers must take account of the reactions of competitors in the industry when making decisions is known as:

A   monopoly.
B   perfect competition.
C   oligopoly.
D   monopolistic competition.   [1½]

X1.18 High entry and exit costs:

A   make collusion more likely.
B   are the main feature of perfectly contestable markets.
C   will benefit consumers.
D   encourage hit and run strategies by new firms.   [1½]

X1.19 Which of the following statements is FALSE?

A   A perfectly competitive market naturally maximises welfare.
B   Potential competitors are those that are actually entering and leaving the industry.
C   Inefficient monopolists may face competition for corporate control.
D   A credible threat is one that rivals expect a firm to carry out.   [1½]

X1.20 The price of a product in perfect competition is always equal to:

I   the marginal cost of all firms
II   the average revenue of all firms
III   the short-run average cost of all firms

A   I and II
B   II and III
C   I only
D   III only   [1½]

X1.21 Which of the following is NOT an example of a barrier to entry?

A   the application of termination fees for consumers who wish to leave a contract before the
         end of the contract period

B   producing a range of products

C   constant returns to scale

D   excessive expenditure on advertising   [1½]

X1.22 A managing director of a monopoly firm is given the following data:

         Marginal revenue   £9
         Marginal cost   £10
         Average cost   £11
         Average revenue   £15

To maximise profits the firm should:

A   reduce price and increase output.
B   reduce price and reduce output.
C   increase price and increase output.
D   increase price and reduce output.   [1½]

X1.23 Firms operating under monopolistic competition will:

A   produce identical goods and enjoy supernormal profits in the long run.
B   produce identical goods and enjoy normal profits in the long run.
C   produce different goods and enjoy supernormal profits in the long run.
D   produce different goods and enjoy normal profits in the long run.   [1½]

X1.24 Two firms operate in a duopoly, but do not collude. Given the payoff matrix of output options to
         Firms A and B below, what is the dominant strategy for the firms?

		Firm B	
		High	Low
Firm A	High	(20, 20)	(50, 10)
	Low	(10, 50)	(40, 40)

A   Firm A – High; Firm B – Low
B   Firm A – High; Firm B – High
C   Firm A – Low; Firm B – Low
D   Firm A – Low; Firm B – High   [1½]

X1.25 Which of the following is NOT a condition required for first-degree price discrimination?

A   The firm must operate under perfect competition.
B   The firm must have a degree of price control.
C   Consumers must be unable to sell goods on to other consumers.
D   It must be possible to easily determine the prices that consumers are willing to pay.   [1½]

X1.26 A loss leader may be used as part of which of the following pricing strategies?

A   predatory pricing
B   full-range pricing
C   peak-load pricing
D   first-degree price discrimination   [1½]

X1.27 Consider the market for plums in 2018 in which demand and supply are given by the following functions.

$$Q_d = 90 - 0.8P$$

$$Q_s = P$$

(i)   Determine the equilibrium market price and quantity in 2018.   [1]

(ii)   Suppose that a poor summer in 2019 means that the supply of plums is reduced by 30% at all price levels. Calculate the equilibrium market price and quantity in 2019 assuming that demand is unchanged.   [1]

(iii)   State how much greater or smaller the total revenue of plum farmers is in 2019 compared to 2018.   [1]
                                                                                [Total 3]

X1.28 Give an example and explain the likely effect of each the following:

(i)   a financial incentive   [1]

(ii)   a non-financial incentive   [1]

(iii)   an incentive that has undesirable effects (a perverse incentive).   [1]
                                                                                [Total 3]

X1.29 Use the information in the table and the average method to calculate, to two decimal places, the following elasticities:

	Point 1	Point 2
Quantity demanded of Good X	250	300
Quantity supplied of Good Y	100	110
Price of Good X	50	45
Price of Good Y	60	65
Income of Individual A	250	260

(i)   income elasticity of demand of Good X   [1]

(ii)   price elasticity of supply of Good Y   [1]

(iii)   price elasticity of demand of Good X   [1]

(iv)   cross-price elasticity of Good X with respect to the price of Good Y.   [1]
                                                                                              [Total 4]

X1.30 Distinguish between risk and uncertainty and list four ways in which a fruit farmer could reduce the uncertainty concerning his income at harvest time.   [3]

X1.31 *Read parts (i) to (iv) before answering. Use only one diagram for this question.*

A consumer consumes only two goods, X and Y. He has an income of £500, which is spent on the two goods. Good X costs £10 per unit and Good Y costs £5 per unit. Both goods are normal goods.

(i)   Draw a budget line for the consumer labelled *B1*. On your diagram use quantity of Good Y on the vertical axis and quantity of Good X on the horizontal axis. Clearly mark the quantities of Good X and Good Y where the budget line meets the axes.   [1]

(ii)   Draw an indifference curve for the consumer at a point where the consumer is maximising his satisfaction. Label the quantity of Good X consumed as *X1*, the quantity of Good Y consumed as *Y1* and the indifference curve as *IC1*.   [1]

The price of Good X now falls from £10 to £5 per unit.

(iii)   Draw a new budget line for the consumer labelled *B2*. Clearly mark the quantity of Good X where the budget line meets the X axis. Draw a new indifference curve for the consumer at a point where the consumer is maximising his satisfaction and label the quantity of Good X consumed as *X2*, the quantity of Good Y consumed as *Y2* and the indifference curve as *IC2*.   [1]

(iv)   Indicate clearly the substitution effect of the fall in the price of Good X by drawing a new budget line labelled *B3*, marking the corresponding amount of Good X consumed as *X3* and quantity of Good Y consumed as *Y3*.   [1]
                                                                                              [Total 4]

X1.32   Describe how a consumer's behaviour can be influenced by:

(a)   the effect it has on others

(b)   the behaviour of others.   [4]

X1.33   Shearer Ltd produces garden shears. It estimates that it faces a demand curve for its shears such that:

$$P = 200 - 20Q_d$$

The table below shows the short-run total cost of producing garden shears up to an output level of six pairs.

Output	Total cost
0	100
1	250
2	360
3	440
4	490
5	530
6	580

(i)   Determine the average and marginal revenue at each level of output.   [2]

(ii)   Calculate the marginal cost at each level of output.   [1]

(iii)   Determine the profit-maximising output level of Shearer Ltd and comment on your
         answer.   [2]
                                                                                                              [Total 5]

X1.34   (i)   Using the kinked demand curve model, draw a diagram showing the equilibrium position
                 for a firm operating within an oligopolistic market making supernormal profit. Show the
                 average cost curve (*AC*), the marginal cost curve (*MC*), the average revenue curve (*AR*),
                 the marginal revenue curve (*MR*) and the profit-maximising price (*P1*) and quantity
                 (*Q1*).   [2]

(ii)   Explain why the firm's average revenue curve has the shape shown on your diagram.   [2]
                                                                                                              [Total 4]

X1.35   (i)   Describe the aims of the two major elements of non-price competition.   [3]

(ii)   State the condition for profit-maximisation in the context of these elements and outline
                 the problems with using these elements to maximise profits.   [2]
                                                                                                              [Total 5]

X1.36   Explain with the aid of diagrams how a firm practising third-degree price discrimination will determine its price and output levels.   [6]

X1.37   Discuss, with the use of supply and demand diagrams, how each of the following scenarios may influence the price and equilibrium quantity of housing within the market. Each scenario should be discussed separately.

    (i)   an increase in interest rates   [4]

    (ii)   an expected rise in future house prices   [3]

    (iii)   an increase in the rate of taxation for house builders   [3]
                                                         [Total 10]

X1.38   Perfect competition and monopolistic competition are both market forms characterised by a large number of firms.

Draw diagrams to illustrate the long-run equilibrium position in each, and explain the similarities and differences between the two market forms.   [10]

END OF PAPER

Subject CB2: Assignment X2

2019 Examinations

Time allowed: 3¼ hours

Instructions to the candidate

1. *Please:*

    – *attempt all of the questions, as far as possible under exam conditions*

    – ***begin your answer to each question on a new page***

    – ***leave at least 2cm margin on all borders***

    – *write in black ink using a medium-sized nib because we will be unable to mark illegible scripts*

    – *show full working to multiple-choice questions so that the marker can give helpful advice if you get any of these questions wrong*

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2. *Please **do not**:*

    – *use headed paper*

    – *use highlighting in your script.*

At the end of the assignment

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In addition to this paper, you should have available actuarial tables and an
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- scan your script, cover sheet (and Marking Voucher if applicable) and save as a pdf document, then email it to: ActEdMarking@bpp.com

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  eg 'CB2 Assignment X2 No. 12345', inserting your ActEd Student Number for 12345.

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Subject CB2: Assignment X2

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Number of following pages: _____

Please put a tick in this box if you have solutions and a cross if you do not:

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Under exam conditions
(delete as applicable):   yes / nearly / no

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Score and grade for this assignment (to be completed by marker):

MCQ	Q27	Q28	Q29	Q30	Q31	Q32	Q33	Q34	Q35	Q36	**Total**	
__ / 39	_ / 5	_ / 6	_ / 4	_ / 3	_ / 7	_ / 3	_ / 5	_ / 8	_ / 5	__ / 15	___ / 100	=_____%

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CB2 Multiple-Choice Answer Sheet

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	A	B	C	D		*Marker use only*
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2	[A]	[B]	[C]	[D]		
3	[A]	[B]	[C]	[D]		
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13	[A]	[B]	[C]	[D]		
						Total:

	A	B	C	D	Marker use only
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24	[A]	[B]	[C]	[D]	
25	[A]	[B]	[C]	[D]	
26	[A]	[B]	[C]	[D]	
					Total:

For Questions X2.1–X2.26 indicate on your answer sheet which one of the answers A, B, C or D is correct.

X2.1   Which of the following describes social efficiency?

I   a situation of Pareto optimality

II   a situation in which changes in production or consumption can only make one person better off if they make another worse off

III   a situation in which marginal social benefit equals marginal social cost

A   I and II
B   I, II and III
C   I only
D   III only   [1½]

X2.2   The diagram below shows the profit-maximising price and output for a monopolist.
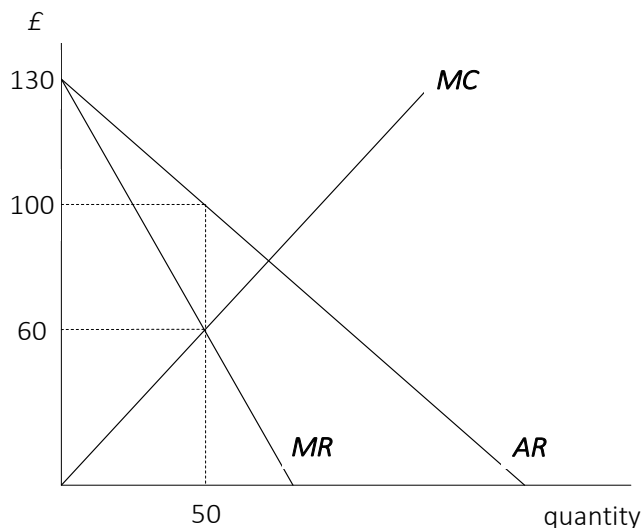
What are the values of the consumer surplus and the producer surplus?

A   The consumer surplus is 750, the producer surplus is 2,000.
B   The consumer surplus is 750, the producer surplus is 3,500.
C   The consumer surplus is 1,500, the producer surplus is 2,000.
D   The consumer surplus is 1,500, the producer surplus is 3,500.   [1½]

X2.3   A key difference between a public good and a merit good is that:

   A   public goods are provided by central government and merit goods by public corporations.

   B   it is possible to provide a public good to one person without it being available to others, whereas it is impossible to provide a merit good to one person without it being available to others.

   C   the supply of public goods is infinite whereas merit goods are limited in supply.

   D   one person's consumption of a public good leaves the amount available for others unaffected, whereas one person's consumption of a merit good reduces the amount available for others.   [1½]

X2.4   The demand and supply functions for Good A are as follows:

$$Q_d = 40 - 2P$$

$$Q_s = \tfrac{1}{2}P$$

   The government now introduces a subsidy of 5 per unit, payable to firms, in order to encourage consumption of Good A. The cost of this subsidy will be:

   A   20
   B   30
   C   40
   D   50   [1½]

X2.5   Which of the following is NOT an example of collusion between firms?

   A   horizontal price fixing
   B   agreement to limit production to keep supply low
   C   increasing R&D to gain a competitive advantage
   D   sharing out sources of supply   [1½]

X2.6   Which of the following are considered to be one of the three stages of technological change?

   I   Research leads to the invention of a new product.
   II   The new product is copied by competitor firms.
   III   New ideas are put into practice.

   A   I and II
   B   I, II and III
   C   I only
   D   III only   [1½]

X2.7 Which of the following statements about national income is always true in a country in which taxes on goods exceed subsidies?

I   GNY > GDP
II   GNY > NNY
III   NNY at market prices > NNY at basic prices

A   I and II
B   II and III
C   I only
D   III only   [1½]

X2.8 Aggregate demand in France is:

A   the amount that French firms, households and government plan to spend on goods and services.

B   the amount that French firms, households and government plan to spend on domestic goods and services.

C   the amount that French and foreign firms, households and governments plan to spend on French goods and services.

D   the amount that French firms, households and government actually spend on domestic goods and services.   [1½]

X2.9 Which of the following is NOT a substitution effect on aggregate demand as a result of a rise in the price level?

A   the decrease in investment caused by the increase in interest rates
B   the decrease in consumption caused by the real balance effect
C   the decrease in consumption caused by a decrease in real incomes
D   the increase in the demand for imports caused by reduced competitiveness   [1½]

X2.10 For an economy in equilibrium, savings = 300, investment = 200, exports = 100, imports = 150 and government spending is 250. Taxation is therefore:

A   50
B   100
C   150
D   200   [1½]

X2.11 Which one of the following is best suited to reducing the level of structural unemployment?

A   lowering the rate of interest
B   raising the rate of unemployment benefit
C   higher voluntary redundancy payments for workers in declining industries
D   more government funds for retraining of the unemployed   [1½]

X2.12   A consumer prices index is a measure of changes in:

   A   the pattern of consumer spending.
   B   the average standard of living.
   C   average earnings.
   D   the average cost of living.   [1½]

X2.13   Which of the following is NOT a method of measuring the output gap?

   A   de-trending techniques
   B   business surveys
   C   production function approach
   D   production possibility curve   [1½]

X2.14   Country A exports Good X to Country B and imports Good Y from Country B. If the price of Good X
           rises by 40% and the price of Good Y falls by 30%, what can be said about Country A's terms of
           trade index?

   A   It has increased by 40%.
   B   It has increased by 70%.
   C   It has increased by 100%.
   D   It has decreased by 100%.   [1½]

X2.15   If, with one hour of labour, Country A can produce 10 units of Good X or 5 units of Good Y; and
           Country B can produce 6 units of Good X or 2 units of Good Y, then:

   A   Country A has an absolute advantage in Good X and a comparative advantage in Good X.

   B   Country B has an absolute advantage in Good X and a comparative advantage in Good X.

   C   Country A has an absolute advantage in Good X and Country B has a comparative
              advantage in Good X.

   D   Country B has an absolute advantage in Good X and Country A has a comparative
              advantage in Good X.   [1½]

X2.16   Which of the following is recorded as a plus in the balance of payments accounts of Country A?

   A   the export of goods by Country A to the rest of the world
   B   short-term lending by Country A to the rest of the world
   C   the purchase of foreign shares by residents of Country A
   D   the payments of interest by residents of Country A to residents of other countries   [1½]

X2.17   An increase in the value of the pound sterling will:

I   increase the price of imports into the UK.
II   increase the volume of exports from the UK.
III   improve the UK's terms of trade.

A   I and II
B   II and III
C   I only
D   III only   [1½]

X2.18   Which of the following is NOT one of the four limits to trade?

A   increasing opportunity costs
B   transport costs outweighing any comparative advantage
C   strategy, structure and rivalry of firms
D   government restrictions on trade   [1½]

X2.19   Which one of the following is a high-earning but relatively illiquid asset of banks?

A   certificates of deposit
B   loans and advances to customers
C   Treasury bills
D   cash held at the central bank   [1½]

X2.20   The process of repackaging assets into marketable securities is known as:

A   secondary action.
B   speculation.
C   securitisation.
D   subcontracting.   [1½]

X2.21   An increase in the average riskiness of a bank's assets, assuming that nothing else changes, will result in:

A   an increase in the capital adequacy ratio.
B   a decrease in the capital adequacy ratio.
C   an increase in the liquidity ratio.
D   a decrease in the liquidity ratio.   [1½]

X2.22   Prudential control:

A   is concerned with the financial health of the banking system as a whole and its impact on the wider economy.

B   is a requirement that each bank maintains sufficient liquidity.

C   is measured in terms of the ratio of a bank's share capital and reserves to its risk-weighted assets.

D   does not apply to global systemically important banks.   [1½]

X2.23   To improve the cash position of banks, the central bank could do any of the following EXCEPT:

A   buy government bonds from banks with an agreement to sell them back later.

B   issue more government bonds and fewer Treasury bills.

C   buy Treasury bills from the banks before maturity.

D   rediscount Treasury bills.   [1½]

X2.24   Which of the following will lead to a decrease in the demand for money?

A   an increase in actual prices

B   increased expectations of price rises

C   a reduction in the use of credit cards

D   a switch from weekly to monthly payment of wages   [1½]

X2.25   The central bank is concerned about rising domestic inflation. Which of the following monetary measures would NOT be suitable as a means to try and reduce inflation?

A   introducing minimum reserve ratios for banks

B   reducing its lending to banks

C   buying government bonds from banks

D   funding the PSNCR with more government bonds and fewer Treasury bills   [1½]

X2.26   The policy remit of the European Central Bank is to:

A   achieve a target inflation rate of below, but close to, 2% *pa* over the medium term.

B   target an inflation rate of close to 2% *pa*, whilst taking account of the volatility of output.

C   target low inflation, together with sustainable growth, low unemployment and moderate long-term interest rates.

D   target an inflation rate of exactly 2% *pa*.   [1½]

X2.27   Consider the following information about Country A, Country B and Country C for the year 2018.

	Country B	Country C
GDP (Country A = 100)	120	80
GDP per head (Country A = 100)	110	90
GDP (PPS*) per head (Country A = 100)	105	95
Index of well-being (Country A = 100)	85	105

* PPS (Purchasing Power Standard) is GDP measured at a country's PPP (Purchasing Power Parity) exchange rate.

Analyse the data given to compare the living standards of the three countries.   [5]

X2.28   Explain, using an aggregate supply and aggregate demand diagram for each part, the likely impact in the short run on the general price level and the level of real GDP of:

(i)   an increase in the cost of raw materials   [3]

(ii)   an increase in income tax.   [3]
                                                                                 [Total 6]

X2.29   Explain four problems of inflation.   [4]

X2.30   Outline the main factors that determine the average duration of unemployment.   [3]

X2.31   (i)   Define the terms 'absolute advantage' and 'comparative advantage'.   [2]

(ii)   Explain why countries tend to have a comparative advantage in goods that are intensive in the country's abundant factor and the impact of trade on the price of these abundant factors in different countries.   [2]

The world consists of two countries, A and B, and the only factor of production is labour. In Country A it takes twenty hours to produce one unit of Good X and five hours to produce one unit of Good Y. In Country B it takes thirty hours to produce one unit of Good X and fifteen hours to produce one unit of Good Y.

(iii)   Explain which country has the comparative advantage in the production of Good X.   [1]

(iv)   Explain which country has the absolute advantage in the production of Good X.   [1]

(v)   Explain whether international trade would take place between the two countries if the terms of trade were one unit of Good Y for one unit of Good X.   [1]
                                                                                 [Total 7]

X2.32 You are given the following data on Country E's international transactions for the year 2018 with the rest of the world (ROW):

	£ million
Exports of goods and services (paid for in cash)	120
Imports of goods and services	140
Interest, profits and dividends received from ROW	30
Interest, profits and dividends paid to ROW	20
Export of goods on trade credit	40
Loans received from ROW	30
Capital balance	−10
Net errors and omissions	?
Increase in official reserves	20

(i) Calculate the current account balance.   [1]

(ii) Calculate the financial account balance.   [1]

(iii) Calculate the value of the net errors and omissions item (make sure you clearly indicate whether it is positive or negative).   [1]
[Total 3]

X2.33 (i) Assume that the public holds all of its money in bank accounts, the banks' liquidity ratio is 12.5% and the monetary base is $100 million.

(a) Calculate the money multiplier and hence the value of the broad money supply.

(b) Suppose banks reduce their proportion of liquid reserves to deposits from 12.5% to 10%, calculate the revised value of the broad money supply.   [3]

(ii) Suppose the public instead decide to hold 20% of their money as cash rather than put all their money in the banks.

(a) Explain what would happen to the value of the money multiplier.

(b) Calculate the revised values of the money multiplier and the broad money supply, assuming that the banks' ratio of liquid reserves to deposits is still 10%.   [2]
[Total 5]

X2.34 (i) Draw a diagram to illustrate equilibrium in the money market assuming an endogenous money supply and outline why the money demand curve and the money supply curve have the shapes shown. [3]

(ii) Explain and illustrate how a reduction in the money supply to *MS2* would affect the market rate of interest in the short run. [1]

(iii) Explain how an increase in the money supply is likely to affect both the exchange rate and the current account of the balance of payments. [4]

[Total 8]

X2.35 Define financial intermediary and outline the main services provided by financial intermediaries. [5]

X2.36 (i) Using a diagram, explain why pollution created by the production process causes a misallocation of resources in a free market. [5]

(ii) Discuss the relative merits of using taxation and legislation as a means of correcting this form of market failure. [10]

[Total 15]

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Subject CB2: Assignment X3

2019 Examinations

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☐ ☐ ☐ ☐ ☐	Time to do assignment (see Note below): _____ hrs _____ mins
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22	[A]	[B]	[C]	[D]	
23	[A]	[B]	[C]	[D]	
24	[A]	[B]	[C]	[D]	
25	[A]	[B]	[C]	[D]	
26	[A]	[B]	[C]	[D]	
				Total:	

For Questions X3.1–X3.26 indicate on your answer sheet which one of the answers A, B, C or D is correct.

X3.1   Which of the following statements is TRUE?

A   If aggregate demand exceeds actual output, then firms' stocks will fall and national income will rise.

B   If aggregate demand exceeds actual output, then firms' stocks and national income will both rise.

C   If aggregate demand exceeds actual output, then firms' stocks and national income will both fall.

D   If aggregate demand exceeds actual output, then firms' stocks will rise and national income will fall.   [1½]

X3.2   Which one of the following will increase the size of the multiplier?

A   an increase in the marginal propensity to import
B   an increase in the marginal tax rate
C   a decrease in the marginal propensity to consume
D   a decrease in the marginal propensity to save   [1½]

X3.3
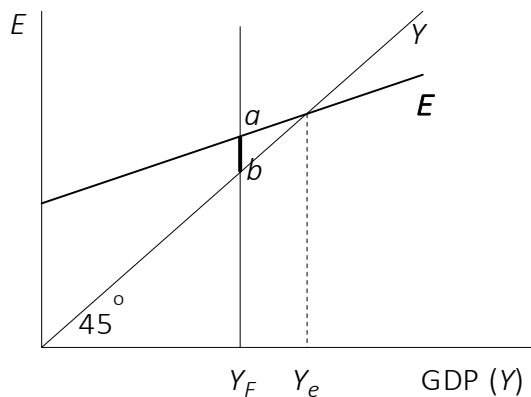
In the diagram, the distance ab represents the:

A   output gap.
B   recessionary gap.
C   deflationary gap.
D   inflationary gap.   [1½]

X3.4   The quantity theory of money assumes that the:

A   ratio of the velocity of circulation to the price level rises when the money supply increases.

B   ratio of the velocity of circulation to the price level is fixed.

C   ratio of the money supply to the velocity of circulation is fixed.

D   ratio of the money supply to the price level is fixed.   [1½]

X3.5   Under the gold standard:

A   an increase in prices led to an inflow of gold.

B   an increase in imports led to an inflow of gold.

C   balance of payments deficits were paid in gold.

D   there was no relationship between the amount of gold and the price level.   [1½]

X3.6   In the following diagram the initial equilibrium real wage is w_1 and the equilibrium level of employment is Q_1.
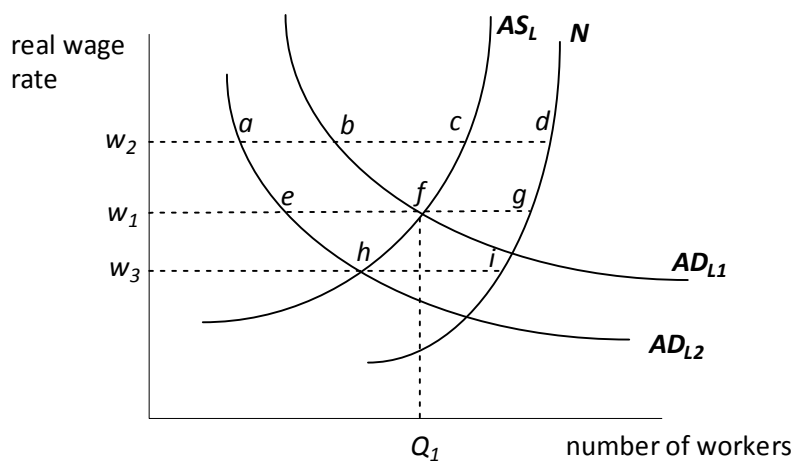
According to the classical economists, a decrease in aggregate demand in the goods market will:

A   decrease the demand for labour, decrease the real wage rate to w_3 and increase the equilibrium level of unemployment to $i-h$.

B   decrease the demand for labour, maintain the real wage rate at w_1 and increase unemployment by the disequilibrium unemployment of $f-e$.

C   increase the real wage in the short run and decrease it to w_1 in the long run.

D   increase the real wage to w_2 and increase unemployment to $d-b$ in the long run.   [1½]

X3.7 Assume that the actual rate of unemployment is below the natural rate of unemployment because the expected rate of inflation is below the actual rate of inflation. If the expected rate of inflation rises to equal the actual rate of inflation, then:

A   real output will increase and unemployment will increase.
B   real output will increase and unemployment will decrease.
C   real output will decrease and unemployment will increase.
D   real output will decrease and unemployment will decrease.   [1½]

X3.8 Which of the following factors could lead to an upward shift in the expectations-augmented Phillips curve?

I   an increase in expected inflation
II   an increase in actual inflation
III   an increase in demand-deficient unemployment

A   I only
B   I and II only
C   I and III only
D   I, II and III   [1½]

X3.9 Which of the following statements is NOT true?

A   Stagflation can be explained in terms of Phillips loops.

B   If inflation is falling, the adaptive expectations hypothesis suggests that inflation will be consistently over-estimated.

C   A fall in structural unemployment will shift the Phillips curve to the right.

D   The vertical long-run Phillips curve suggests that inflation can be reduced without a long-term increase in unemployment.   [1½]

X3.10 An increase in the money supply will have a bigger impact on real output the more:

A   interest-elastic is the demand for money and the more interest-elastic is the demand for investment.

B   interest-inelastic is the demand for money and the less interest-elastic is the demand for investment.

C   interest-elastic is the demand for money and the less interest-elastic is the demand for investment.

D   interest-inelastic is the demand for money and the more interest-elastic is the demand for investment.   [1½]

X3.11   Which one of the following is NOT a 'crowding out' effect resulting from a fiscal expansion?

    A   a fall in investment due to the associated rise in the interest rate

    B   a fall in consumer demand due to the associated rise in the interest rate

    C   reduced import expenditure due to increased government demand for domestically produced goods

    D   a fall in demand for exports due to an exchange rate appreciation caused by the associated rise in the interest rate   [1½]

X3.12   Other things remaining the same, the result of moving from a balanced budget to a budget surplus that the government uses to buy back debt from the non-bank private sector, is:

    A   higher short-term interest rates because the *LM* curve moves to the left.
    B   lower short-term interest rates because the *LM* curve moves to the right.
    C   higher short-term interest rates because the *IS* curve moves to the right.
    D   lower short-term interest rates because the *IS* curve moves to the left.   [1½]

X3.13   Which of the following is NOT a reason why the power of labour has reduced?

    A   a reduction in the power of trade unions
    B   an increase in the use of short-term contracts
    C   an increase in the number of nationally negotiated wage contracts
    D   an increase in the exposure to international competition   [1½]

X3.14   Which of the following is NOT an interventionist supply-side policy?

    A   the use of public-private partnerships
    B   the provision of infrastructure
    C   the location of government offices in depressed areas
    D   provision of R&D by government research institutions   [1½]

X3.15   Which of the following statements is FALSE?

    A   The neo-Austrian / libertarian school of thought advocates minimum liberty for economic agents to pursue their own interests and to own property.

    B   Modern Keynesians advocate supply-side policies to shift the Phillips curve to the left.

    C   New classical economists favour market-orientated supply-side policies.

    D   'Third Way' supply-side policies are based on the concept of helping people to help themselves.   [1½]

X3.16   Which of the following statements about a Taylor rule is NOT true?

A   It can be used to influence expectations of inflation.
B   It requires that interest rates be increased if inflation is above its target level.
C   It requires that interest rates be increased if real GDP is above its potential level.
D   It is open to political abuse.   [1½]

X3.17   An increase in government spending has:

A   a greater impact than an equal decrease in taxation has on national income.

B   the same impact as an equal decrease in taxation has on national income.

C   a smaller impact than an equal decrease in taxation has on national income.

D   a multiplier effect on national income that is smaller than the multiplier effect of an equal
         decrease in taxation.   [1½]

X3.18   A government wishing to increase aggregate demand might use any of the following measures
            EXCEPT:

A   buying government securities on the open market.
B   allowing interest rates to fall.
C   increasing the tax on consumer goods.
D   increasing social security benefits.   [1½]

X3.19   The payment of wages to refuse collectors is categorised as both:

A   current expenditure and final expenditure.
B   capital expenditure and final expenditure.
C   current expenditure and transfers.
D   capital expenditure and transfers.   [1½]

X3.20   Suppose that in Country A, the budget surplus is 20, investment is equal to 50 and savings are equal
            to 40. Then the trade balance must be equal to:

A   −10.
B   +10.
C   −30.
D   +30.   [1½]

X3.21 An exchange rate system in which rates are fixed for a period of time but may be revalued or devalued in response to a substantial balance of payment surplus or deficit is referred to as:

A   an adjustable peg.
B   a crawling peg.
C   a joint float.
D   managed floating.   [1½]

X3.22 Which of the following is NOT a possible advantage of freely floating exchange rates?

A   Current account deficits are corrected automatically.
B   Their operation requires that there is sufficient international liquidity.
C   It provides a degree of insulation against external shocks.
D   Governments are free to implement their chosen domestic macroeconomic policy.   [1½]

X3.23 In order to adopt the euro, each EU country had to meet convergence criteria that referred to all of the following EXCEPT:

A   the national debt.
B   unemployment.
C   interest rates.
D   the inflation rate.   [1½]

X3.24 The loss of separate monetary policies within the eurozone is:

A   an advantage of European Monetary Union.
B   an argument against the principle of European Monetary Union.
C   a criticism of the current design of European Monetary Union.
D   none of the above.   [1½]

X3.25 Which of the following do you NOT associate with classical economists?

A   loanable funds theory
B   Say's law
C   quantity theory of money
D   paradox of thrift   [1½]

X3.26 Possible causes of the financial crisis in 2008 include all of the following EXCEPT:

A   the increase in sub-prime debt.
B   the increased use of wholesale funding by the banks.
C   moral hazard.
D   counter-cyclical bank lending.   [1½]

X3.27   We have the following information about the economy of Country X:

- the marginal propensity to consume domestically produced goods out of national income is 0.6

- tax is raised at a fixed rate of 10% of all income

- imports are a fixed 20% of income

- autonomous (or exogenous) consumption = $5,000

- investment = $10,000

- government spending = $10,000

- exports = $25,000

(i)   Calculate:

(a)   the withdrawals function

(b)   the equilibrium level of national income

(c)   the multiplier.   [3]

(ii)   The government increases its annual spending on infrastructure projects by $50,000. Calculate:

(a)   the new equilibrium level of national income

(b)   the effect of the new injection on the government's budget and on the balance of payments.   [3]
[Total 6]

X3.28   Describe the views of new classical and Keynesian economists towards hysteresis. (Diagrams are not required.)   [5]

X3.29   Explain the new classical view that there is no distinction between the business cycle and long-term economic growth.   [4]

X3.30   Outline the transmission mechanisms by which an increase in the money supply might affect aggregate demand and hence prices.   [4]

X3.31   Explain the main elements of the dynamic stochastic general equilibrium models that were developed during the period known as the 'Great Moderation'.   [4]

X3.32   Explain the possible impact on business of a reduction in the rates of income tax and corporation tax.   [4]

X3.33   State the views of new classical and Keynesian economists on the approaches to demand- and supply-side policies.   [3]

X3.34 (i) Define the term budget deficit. [1]

(ii) State, with examples, two ways in which a recession can increase the size of the government's budget deficit. Illustrate your answer with a diagram. [4]

(iii) Describe what is meant by the structural deficit or surplus. [1]
[Total 6]

X3.35 (i) Define the real exchange rate index. [1]

(ii) Over the past year, Country X's nominal exchange rate index has decreased by 10%, the index of its export prices has increased by 20% and the index of its import prices has decreased by 20%. Calculate the percentage change in the real exchange rate index. [1]
[Total 2]

X3.36 Explain, with the aid of an example, what is meant by the international trade multiplier and state the key influence on its value for a particular country. [3]

X3.37 (i) Use the *IS-MP* model to illustrate and explain the effect on interest rates and national income of:

- an increase in the demand for exports

- a loosening of monetary policy. [5]

(ii) Use the extended *IS-LM* analysis for an open economy, assuming that the *BP* curve is flatter than the *LM* curve, to illustrate and explain the effect on national income of an increase in the money supply. You should assume the economy operates a floating exchange rate system. [5]
[Total 10]

X3.38 Describe policies that a government could introduce to encourage economic growth. [10]

END OF PAPER

For the session leading to the April 2019 exams – CB Subjects

Marking vouchers

Subjects	Assignments	Mocks
CB1	6 March 2019	13 March 2019
CB2	13 March 2019	20 March 2019

Series X Assignments

Subjects	Assignment	Recommended submission date	Final deadline date
CB1	**X1**	**5 December 2018**	30 January 2019
CB2		**12 December 2018**	6 February 2019
CB1	**X2**	**9 January 2019**	13 February 2019
CB2		**16 January 2019**	20 February 2019
CB1	**X3**	**6 February 2019**	27 February 2019
CB2		**13 February 2019**	6 March 2019

Mock Exams

Subjects	Recommended submission date	Final deadline date
CB1	**27 February 2019**	13 March 2019
CB2	**6 March 2019**	20 March 2019

We encourage you to work to the recommended submission dates where possible.

If you submit your mock on the final deadline date you are likely to receive your script back less than a week before your exam.

For the session leading to the September 2019 exams – CB Subjects

Marking vouchers

Subjects	Assignments	Mocks
CB1	28 August 2019	4 September 2019
CB2	4 September 2019	11 September 2019

Series X Assignments

Subjects	Assignment	Recommended submission date	Final deadline date
CB1	**X1**	**19 June 2019**	24 July 2019
CB2		**26 June 2019**	31 July 2019
CB1	**X2**	**10 July 2019**	7 August 2019
CB2		**17 July 2019**	14 August 2019
CB1	**X3**	**31 July 2019**	21 August 2019
CB2		**7 August 2019**	28 August 2019

Mock Exams

Subjects	Recommended submission date	Final deadline date
CB1	**21 August 2019**	4 September 2019
CB2	**28 August 2019**	11 September 2019

We encourage you to work to the recommended submission dates where possible.

If you submit your mock on the final deadline date you are likely to receive your script back less than a week before your exam.

Markers: This document sets out one approach to solving each of the questions. However, please:

- *give credit for other valid approaches*

- *award full marks for the correct answer to calculation questions, with or without working, but in the case of an incorrect final answer, please award method marks as given.*

Answers to multiple-choice questions

The following table gives a summary of the answers to the multiple-choice questions. The answers are repeated below with explanations.

1	A		**10**	A		**19**	B
2	C		**11**	B		**20**	A
3	B		**12**	C		**21**	C
4	C		**13**	A		**22**	D
5	C		**14**	D		**23**	D
6	D		**15**	B		**24**	B
7	B		**16**	B		**25**	A
8	A		**17**	C		**26**	B
9	C		**18**	A			

Solution X1.1

Option A.

Recall that the *opportunity cost* of something is what you have to give up in order to get it. It is often measured in terms of the value of the best alternative foregone.   [1½]

Solution X1.2

Option C.

The production possibility curve shows all the possible combinations of two goods that an economy can produce in a specified time period assuming that all resources are fully employed and working to maximum efficiency. It therefore shows the *limits* to production; only combinations *on* or *inside* the frontier curve can be produced. Consequently, combinations of goods on the *outside* of the curve are unattainable.   [1½]

Solution X1.3

Option B.

A free market economy is one in which there is no government intervention. Instead, all allocation decisions are made by the interaction of demand and supply, driven by consumers (aiming to maximise their utility) and suppliers (aiming to maximise their profits). [1½]

Solution X1.4

Option C.

According to Marx, surplus value is the value of the output workers have produced in excess of their own labour cost. [1½]

Solution X1.5

Option C.

A leftward shift in the demand curve corresponds to a *decrease* in demand. If the price of a complementary good increases, then the demand for that good will decrease, and so will the demand for Good X.

Options B and D will both lead to an *increase* in demand for Good X. (Note that an increase in consumer income (Option D) would shift the demand curve to the left if Good X was an *inferior good*.) An increase in the price of Good X (Option A) will reduce the *quantity demanded*, ie it will lead to a movement *along* the demand curve towards the left.

[1½]

Solution X1.6

Option D.

Draw a diagram to prove this to yourself. Prices move a lot when supply and demand curves are both steep, *ie* relatively inelastic. Under Option C, *quantity* would change a lot. [1½]

Solution X1.7

Option B.

Good X is an *inferior good* because it has a *negative* income elasticity of demand, indicating that demand for the good decreases as consumer income increases.

Good X is a *substitute* for Good Y because it has a *positive* cross-price elasticity of demand. This indicates that an increase in the price of Good Y will lead to an increase in the demand for Good X, as consumers switch from buying Good Y to buying Good X instead. [1½]

Solution X1.8

Option A.

In the context of insurance, *moral hazard* occurs when a policyholder behaves differently because he or she (already) has insurance. Specifically, the policyholder will engage in problematic behaviour to the detriment of the insurer. This is the case in Option A, where the policyholder is less concerned about locking her garage in the knowledge that she has a higher level of cover, thus increasing the risk to the insurer.   [1½]

*Option C would be regarded as **adverse selection** if the intention to take flying lessons were not declared by the applicant.*

Solution X1.9

Option C.

We need to add together the marginal utilities of each extra Twix or Mars bar to find out which combination of chocolate bars maximises the consumer's utility. Because the consumer's budget is £4.50 and all chocolate bars cost 90 pence, we know that she can only buy a total of five chocolate bars.

For Option C, the consumer's total utility is 90 + 60 + 40 + 50 + 40 = 280. Any other combination gives a lower level of utility.

An alternative method is to equate the ratio of the prices of the two goods with the ratios of their marginal utilities. Here, we need:

$$\frac{MU_{Mars}}{MU_{Twix}} = \frac{P_{Mars}}{P_{Twix}}$$

Because the prices are the same, we need to find the levels of consumption where the marginal utilities are equal, bearing in mind the total cost constraint. This occurs where:

$$MU_{Mars} = MU_{Twix} = 40$$

ie three Mars bars and two Twix bars.   [1½]

Solution X1.10

Option A.

Option A is correct because a risk-averse individual will be prepared to pay more for insurance than the long-run average value of claims that will be made. Consequently, he will on average be less well off in *monetary terms*. However, insurance will be bought if it makes the individual better off in terms of *expected utility*.

While a risk-averse investor might buy insurance if the expected return is negative, zero or positive, a risk-neutral investor will buy insurance only if the expected return is zero or positive. A risk-seeking investor will buy insurance only if the expected return is positive.   [1½]

Solution X1.11

Option B.

The value of a product to a person who owns the product can be considered in terms of the amount he is *willing to accept* (WTA) for the product, whereas the value to a person who does not have the product can be considered in terms of the amount he is *willing to pay* (WTP) to obtain it. Many studies have shown that the WTA is greater than the WTP, showing that ownership endows additional value to the product. This is known as the *endowment effect* or *divestiture aversion*, *ie* the aversion to losing what is owned.

Option A refers to *present bias*, *ie* a form of *time-inconsistent behaviour*, which involves the giving of greater weight to present payoffs relative to future payoffs than would be predicted by standard discounting techniques.

Option C refers to the effect that other people have on a consumer's perception of a product. This *herding effect* can lead to price bubbles.

Option D refers to the effect of *framing* on a consumer's choice.   [1½]

Solution X1.12

Option C.

Marginal cost is usually defined as the change in total costs when output is expanded by one unit. Total costs are made up of fixed costs and variable costs. Fixed costs are fixed. So, the change in *total costs* as output expands is the same as the change in *variable costs* as output expands.   [1½]

Solution X1.13

Option A.

The optimum combination of labour and capital required to produce Good X as efficiently as possible is where the ratio of marginal physical product to cost is the same for both factors, *ie*:

$$\frac{MPP_L}{P_L} = \frac{MPP_K}{P_K}$$

Currently:

$$\frac{38}{30} < \frac{14}{10}$$

So, to achieve efficient production it is necessary to increase the marginal physical product of labour relative to that of capital. Given that both factors are subject to diminishing marginal returns, this could be achieved by reducing the input of labour and increasing the input of capital.   [1½]

Alternatively, the company is currently obtaining more output per $ spent on capital than on labour. So, the profit-maximising company should increase its use of capital and decrease its use of labour. As it does so, the marginal physical product of capital decreases and the marginal physical product of labour increases until equilibrium is achieved.

Solution X1.14

Option D.

Economies of scale refer to changes in the *scale* of production, not time.   [1½]

Note that indivisibilities and the division of labour are both examples of plant economies of scale, which arise because of the large size of the factory; economies of scope is not.

Solution X1.15

Option B.

If a firm is making normal profits, this means that supernormal profits, *ie* economic profits, are zero. Thus total economic costs equal total revenue, and average costs equal average revenue. Option C *maximises* profit, which may mean that profits are a lot more (or a lot less) than normal profits.   [1½]

Solution X1.16

Option B.

A profit-maximising firm should keep producing in the short run provided that it is able to cover its *variable* costs – in the short run it has to pay its fixed costs come what may. This is the case when average revenue exceeds average variable cost.   [1½]

Solution X1.17

Option C.

The need to consider the reactions of competitors is a key difference distinguishing oligopoly from other types of market structure.   [1½]

Solution X1.18

Option A.

High entry and exit costs make it easier for firms to collude, since other firms are less likely to enter the industry and interfere with collusive agreements.

The main features of perfectly contestable markets are *low* entry and exit costs.

Competitive markets (*ie not* those with high entry and exit costs) tend to improve efficiency and benefit consumers, who typically pay lower prices and enjoy greater product choice.

A *hit and run strategy* in which a firm enters a market, makes short-term profits and then leaves again when the existing firms cut prices, is more likely when entry costs are low.   [1½]

Solution X1.19

Option B.

Potential competitors are those that *could* enter the market, as opposed to those other firms that are actually in the market at present. (A contestable market is one in which the *threat* of competition is a key determinant of prices and output. The actual *existence* of competition is not necessary.)

A perfectly competitive market produces at the level of output where average revenue is equal to marginal cost. In the absence of external costs and benefits, this corresponds to the socially optimal output level, *ie* where welfare is maximised, so Option A is true.

Competition for corporate control (Option C) refers to the threat of a potential takeover, which should encourage a monopoly to produce efficiently.   [1½]

Solution X1.20

Option A.

All firms are assumed to maximise profits, therefore all firms set marginal revenue (and hence price in perfect competition) equal to marginal cost. So Option I is correct.

Option II is correct because average revenue is always equal to price, whatever the market structure. (This assumes that all customers pay the same price, which is the case under perfect competition, as all the firms are price takers and so have no control over the price they charge.)

Option III is incorrect, because in the short run, price can be greater than, equal to, or less than average cost.   [1½]

Solution X1.21

Option C.

Constant returns to scale (whereby an *x*% increase in all inputs leads to an *x*% increase in output) mean that large firms do not have a cost advantage through being larger than small firms. This means that small firms can enter the market and not be at a severe disadvantage.

Termination fees for consumers who wish to leave a contract before the end of the contract period are a type of *switching cost*, which is an additional cost that deters consumers from buying a product from a different firm. Producing a range of products means that there are no gaps, or niches, in the market for new firms to exploit. Excessive spending on advertising is an aggressive tactic to establish brand loyalty, and also increase the costs of entering the market, making it harder for new entrants to gain market share.   [1½]

Solution X1.22

Option D.

Profits are maximised at the output level where *MC* = *MR*. If *MC* > *MR*, then by producing one fewer unit, the firm can reduce its costs by more than it reduces its revenue and so increase its profits. Hence, the firm should reduce its output and in doing so will be able to increase its price – given that it faces a downward-sloping demand curve.   [1½]

Solution X1.23

Option D.

Firms operating under monopolistic competition produce different goods, which is why they are able to raise their prices without losing all of their sales. In addition, the lack of barriers to entry means that any supernormal profits will typically be competed away by the entry of new firms into the industry, so that only normal profits will be earned in the long run.   [1½]

Solution X1.24

Option B.

A *dominant strategy* is a strategy that is the best strategy for one player, no matter what strategy the other player follows.

Suppose Firm B goes high. If Firm A goes high, it will get a payoff of 20. If it goes low, it will get a payoff of 10. So Firm A should go *high*. Suppose Firm B goes low. If Firm A goes high, it will get a payoff of 50. If it goes low, it will get a payoff of 40. So Firm A should go *high*. Since Firm A should go high no matter what Firm B does, *high* is a dominant strategy for Firm A. This rules out Options C and D.

As the two firms have symmetrical profits, *high* is also a dominant strategy for Firm B. This rules out Options A and C.   [1½]

Note that the combination (High, High) is a dominant equilibrium and a Nash equilibrium.

Solution X1.25

Option A.

A firm operating under perfect competition will not be able to exercise price discrimination, as it is a price taker and has no control over the price that it sets.   [1½]

Solution X1.26

Option B.

Recall that *full-range pricing* is where the firm sets the price on each individual product so as to maximise total profits across its full product range, rather than just to maximise the profit made on each individual product in isolation.

Predatory pricing is where a firm sets its price below its average cost in order to drive other firms out of business. *Peak-load pricing* is where consumers are charged more for a service at peak times than at off-peak times. *First-degree price discrimination* is where the firm charges each consumer the maximum price that they are prepared to pay for a good or service.   [1½]

Solution X1.27

(i)   *Equilibrium price and quantity in 2018*

The equilibrium price and quantity are found by equating supply and demand in the usual way. Thus:

$$90 - 0.8P^* = P^*$$

ie the equilibrium price in 2018 is $P^* = 50$.   [½]

Substituting this back into either the demand or the supply function gives the equilibrium output in 2018 as $Q^* = 50$.   [½]

(ii)   *Equilibrium price and quantity in 2019*

The effect of the poor summer is to reduce supply by 30% at all price levels, so the new supply curve is:

$$Q_s^{'} = 0.7P$$

Equating this to the unchanged demand curve gives:

$$90 - 0.8P^{**} = 0.7P^{**}$$

ie the equilibrium price in 2019 is $P^{**} = 60$.   [½]

Substituting this back into either the demand or the (new) supply function gives the equilibrium output in 2019 as $Q^{**} = 42$. [½]

(iii)   *Change in total revenue*

The total revenue of plum farmers in 2018 is given by:

$$TR = P \times Q = 50 \times 50 = 2,500$$

whereas the total revenue of plum farmers in 2019 is:

$$TR = P \times Q = 60 \times 42 = 2,520$$ [½ for both *TR* calculations]

So, the total revenue is 20 higher in 2019 than 2018. [½]
[Total 1]

Solution X1.28

Markers: There are many possible responses to this question. Please reward any sensible answers, but only award a full mark if the student gives an example along with its likely effect (ie not for two examples).

(i)   *Financial incentive*

The payment by government of tuition fees for teacher training courses … [½]

 … might lead to an increase in the number of trainee teachers. [½]

A 'two for the price of one' offer by a restaurant … [½]

 … might encourage more diners. [½]
[Maximum 1]

(ii)   *Non-financial incentive*

Undertaking a voluntary role … [½]

 … might help the local community / improve the environment. [½]

Making a charitable donation … [½]

 … might help to fund medical research / to promote awareness of an issue / to help developing countries. [½]
[Maximum 1]

(iii)   **Perverse incentive**

Penalties for the late arrival of trains, intended to be an incentive to keep journey times short …

[½]

 … might cause longer journey times as train companies re-timetable journeys allowing them 'catch-up time' at a number of stations along the routes.   [½]

Reducing tax rates to encourage people to work more hours …   [½]

 … might cause a reduction in hours worked as people earn the same 'take-home pay' by working fewer hours.   [½]

[Maximum 1]

Solution X1.29

(i)   **Income elasticity of demand of Good X**

Income elasticity of demand of Good X is:

$$Y\varepsilon_D = \frac{(300-250)/275}{(260-250)/255} = \frac{50/275}{10/255} = +4.64$$

[1]

(ii)   **Price elasticity of supply of Good Y**

Price elasticity of supply of Good Y is:

$$P\varepsilon_S = \frac{(110-100)/105}{(65-60)/62.5} = \frac{10/105}{5/62.5} = +1.19$$

[1]

(iii)   **Price elasticity of demand of Good X**

Price elasticity of demand of Good X is:

$$P\varepsilon_D = \frac{(300-250)/275}{(45-50)/47.5} = \frac{50/275}{-5/47.5} = -1.73$$

[1]

(iv)   **Cross-price elasticity of Good X with respect to the price of Good Y**

Cross-price elasticity of Good X with respect to the price of Good Y is:

$$C\varepsilon_{D_{XY}} = \frac{(300-250)/275}{(65-60)/62.5} = \frac{50/275}{5/62.5} = +2.27$$

[1]

Solution X1.30

Markers: Please reward other sensible suggestions.

Risk refers to a situation in which the probabilities of the different possible outcomes are known, but it is not known which outcome will occur.   [½]

Uncertainty refers to a situation in which the probabilities of the different possible outcomes are not known.   [½]

A farmer could reduce the *uncertainty* concerning his income at harvest time by:

- *storing stocks* of the harvested crops, which can be sold at the most appropriate times, rather than selling the crops all at once   [½]

- *gaining better information* about the likely state (*ie* overall market supply and demand and hence price) of the market at harvest time   [½]

- using *forward or futures contracts* to fix the price at which he will be able to sell his produce at harvest time   [½]

- *buying insurance* to protect himself against financial loss, *eg* from poor weather ruining his crops   [½]

- planting different types of fruit to reduce the risk that any one fruit fails   [½]

- selling fruit to a range of wholesalers to reduce the risk of bad debts.   [½]
                                                                                                                   [Maximum 3]

Solution X1.31
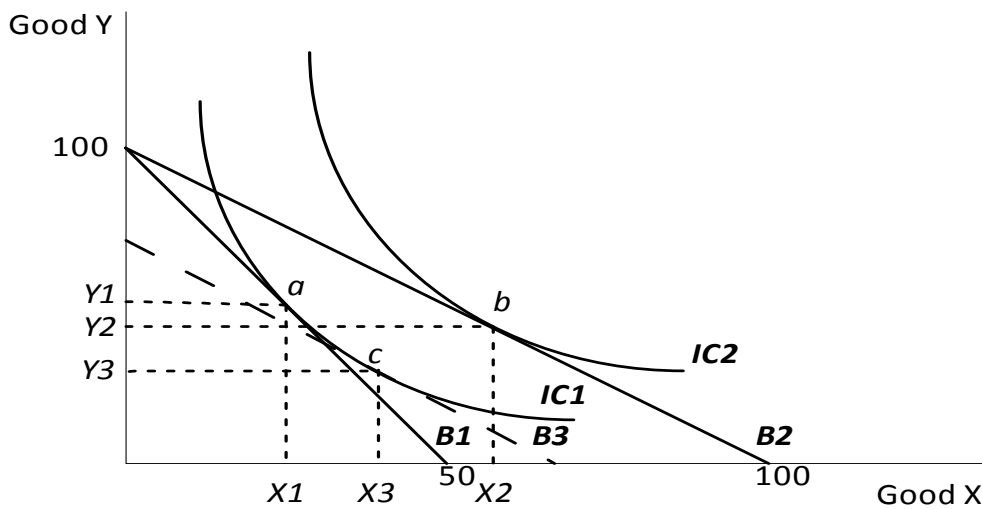
[4 (1 mark for each part of the question)]

Since Good X is a normal good, the substitution and income effects work in the same direction,
ie the decrease in price leads to an increase in quantity demanded because firstly, the fall in the
relative price of Good X causes the consumer to substitute it for Good Y (the increase from X1 to
X3), and secondly, because the consumer reacts to the rise in real income by buying more of
Good X (the increase from X3 to X2).

Solution X1.32

Behavioural economists have found that consumers often consider others when making decisions.
This works in two ways: firstly, behaviour is often influenced by its effect on others; and secondly,
behaviour is also influenced by the behaviour of others.

(a)   ***Effect of behaviour on others***

It has long been appreciated that consumers do not always conform to the traditional model of
self-interest, *ie* of maximising their own payoffs.   [½]

For example, some behaviour displays altruistic preferences, *ie* a willingness to increase the
payoffs to others at personal cost, *eg* buying presents for others; …   [½]

 … while other behaviour displays spiteful preferences, *ie* a willingness to decrease the payoffs of
others at personal cost, *eg* buying a unique product that gives no utility to the buyer in order to
prevent somebody else owning it.   [½]

Since these different types of behaviour can be displayed by the same people at different times
and in different circumstances, a number of models of *reciprocity* have been developed.   [½]

Some of these suggest that people might gain an increase in utility by being kind to those that
have been kind to them and by being unkind to those they believe have been unkind to them. [½]
[Maximum 2]

(b)   ***Effect of others on behaviour***

Consumer behaviour is often influenced by the behaviour of others. For example, when choosing
a new mobile phone or a new car, we might be influenced by the choices made by our family and
friends.   [½]

This suggests that our perceived utility from a product is partly determined by our choice *relative*
to the choice of others, *ie* we feel happier and safer buying a product that has been bought by
those whose judgements we value.   [½]

This behaviour could demonstrate a heuristic under *bounded rationality*, …   [½]

 … since when knowledge is imperfect, a good rule of thumb might be to buy what others are
buying, as they probably know more about the product.   [½]

However, if other people are doing the same, this *herd behaviour* can lead to price bubbles … [½]

 … that burst when prices rise to levels that cannot be justified in terms of the utility gained from
the product.   [½]
[Maximum 2]

Solution X1.33

(i)   *Average revenue and marginal revenue*

At any level of output, the average revenue is simply equal to the price. In order to find the marginal revenue, first find the total revenue (as price × quantity) and then:

marginal revenue (nth unit) = total revenue (n units) – total revenue (n – 1 units)

Thus, we have:

Output	Average revenue	Total revenue	Marginal revenue
0	–	–	–
1	180	180	180
2	160	320	140
3	140	420	100
4	120	480	60
5	100	500	20
6	80	480	−20

[1 each for correct *AR* and *MR* column, less ½ for each error]

(ii)   *Marginal cost*

The marginal cost is found from the information in the question using:

marginal cost (nth unit) = total cost (n units) – total cost (n – 1 units)

Output	Total cost	Marginal cost
0	100	–
1	250	150
2	360	110
3	440	80
4	490	50
5	530	40
6	580	50

[1 for correct *MC* column, less ½ for each error]

(iii)   ***Profit-maximising output and profit level***

We can calculate the profit at each output level as *total revenue minus total cost*.

Output	Profit
0	− 100
1	− 70
2	− 40
3	− 20
4	− 10
5	− 30
6	− 100

Thus, the profit-maximising level of output is four units.   [1]

Alternatively, we can find the profit-maximising output level by comparing MC and MR. Starting from an output level of zero, if we produce an additional unit, then the MR of 180 exceeds the MC of 150, so producing the first unit will increase profits (ie reduce losses). Likewise, the MR of the second unit exceeds the MC (140 against 110), so producing the second unit will again increase profits. The same argument applies equally to the third and fourth units.

For the fifth unit, however, the MC of 40 exceeds the MR of 20 and so producing the fifth unit would reduce profits by 20. Four units must therefore be the profit-maximising output level.

When output is four units, profit is equal to –10, *ie* a loss of 10. However, the firm should not shut down in the short run, ...   [½]

... as to do so would lead to a (larger) loss of 100, equal to the amount of its fixed costs.   [½]

or alternatively:

... as the total revenue of 480 exceeds the total variable cost of 390, and therefore production allows a contribution of 90 to the fixed costs.   [½]
                                                                                    [Total 2]

Solution X1.34

(i)   *Long-run equilibrium under oligopoly (kinked demand curve model)*
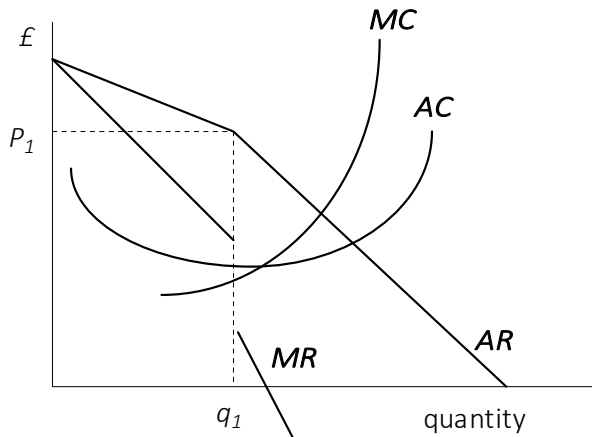
[2 for correct diagram, less ½ for each error]

Note that the AC curve doesn't necessarily go through the gap in the MR curve. However, it must be below P_1 at output q_1, so that supernormal profits are made.

(ii)   *Shape of AR curve*

The demand curve is relatively flat (*ie elastic*) above the equilibrium price (P_1) ...   [½]

... since if the firm raises its prices, it is assumed that other firms *will not respond,* and therefore the firm will suffer a large fall in sales (or a fall in market share).   [½]

The demand curve is steeper (*ie less elastic*) below P_1 ...   [½]

... since if the firm lowers its prices, it is assumed that other firms *will respond* by lowering their prices, and therefore the firm will gain few extra sales (and no increase in market share).   [½]

[Total 2]

Solution X1.35

(i) ***Aims of the two major elements of non-price competition***

Non-price competition involves two major elements: product development and advertising. [½]

Aims of product development

The main aims are to produce a product that:

- will sell well … [½]

    … *ie* one for which demand is high (or potentially high) [½]

- is different from rivals' products … [½]

    … *ie* one that has few close substitutes and so has a relatively inelastic demand. [½]

Aims of advertising

The main aims are to:

- increase demand ... [½]

    … by informing consumers of the product's existence and availability [½]

- make the firm's demand curve less elastic … [½]

    … by highlighting the benefits of the product over that of its rivals' products. [½]

[Maximum 3]

(ii) ***Conditions for maximising profits and problems with the approach***

Both product development and advertising will incur costs. [½]

Profit maximisation occurs where the revenue generated from these activities (marginal revenue) is equal to the cost incurred in carrying out these activities (marginal cost). [½]

While this is straightforward in theory, in practice, it will be difficult to forecast the marginal revenues generated from each activity. [½]

Furthermore, the effects of the product development or advertising on the demand curve depend on the price at that time, and therefore are likely to be different at different prices. [½]

So, in order to maximise profits, firms have to consider the optimum combination of price, product development and advertising. [½]

[Maximum 2]

Solution X1.36

Third-degree price discrimination is where a firm divides consumers into different groups based on some characteristic that is relatively easy to observe …   [½]

… and informative about how much consumers are willing to pay.   [½]

The firm then charges a different price to each group of consumers, …   [½]

… though all the consumers within a particular group pay the same price.   [½]

The following diagram shows the demand and marginal revenue curves in two separate markets, X and Y, and for the market (M) in total.

Market X	Market Y	Total (Market X + Market Y)
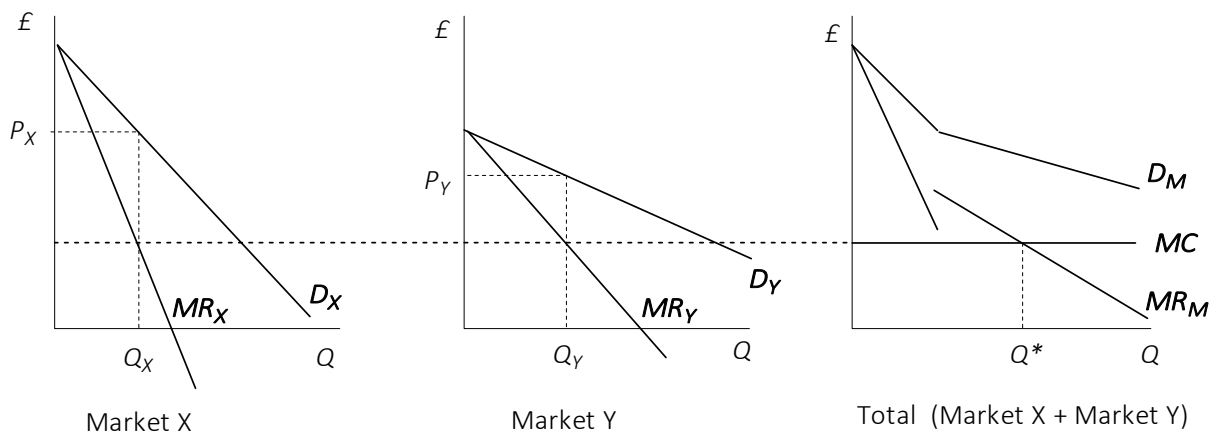
[3 for correct diagram, less ½ for each error]

The firm will determine its total output level, Q^*, by equating its overall MR_M and marginal cost MC …   [½]

We assume for simplicity that MC is constant.

… and how much to sell in each market by setting *MC* equal to MR_X and MR_Y, *ie* Q_X and Q_Y. [½]

The price charged in each market is then set from its respective demand curve, *ie* P_X and P_Y.   [½]

A higher price will be charged where demand is less elastic.   [½]

[Maximum 6]

Solution X1.37

Markers: There are many possible responses to this question. Please reward any sensible answers.

(i)   *An increase in interest rates*

An increase in interest rates would raise the cost of borrowing, including mortgages.   [½]

So, the effective cost of house purchases funded by mortgages would increase, making them less affordable, …   [½]

 … leading to a reduction in the demand for house purchases.   [½]

At the same time, those house builders who are borrowing to finance builds would find that their overall costs increase.   [½]

This increase in costs would lead to a fall in the supply of new homes.   [½]

Finally, a large increase in interest rates could result in some existing homeowners defaulting on their mortgage payments, …   [½]

 … resulting in forced sales of existing properties and hence an increase in supply.   [½]

If both the demand and supply curves shift to the left, there will be an overall reduction in the equilibrium quantity of properties traded in the market. However, the equilibrium price could either rise or fall, depending on the relative sizes of the shifts in demand and supply.   [½]
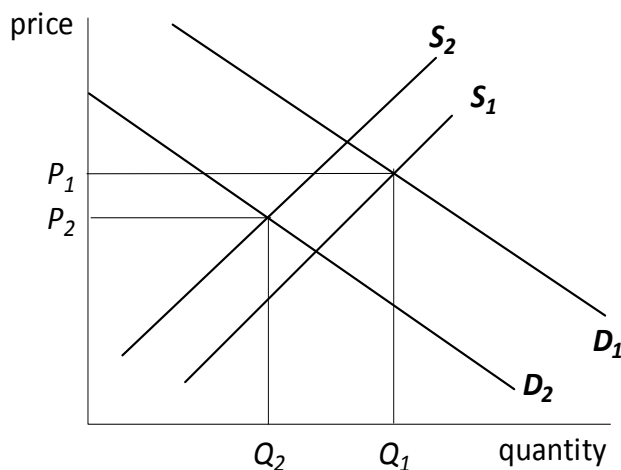
[1 for diagram that matches the explanation]

[Maximum 4]

(ii)   *An expected rise in house prices*

An expected rise in house prices in the *future* would be likely to increase *current* demand for house purchases, as people try to buy ahead of the anticipated price rise. This will be the case for both owner occupiers and investors.   [½]

So, the demand curve would shift to the right.   [½]

At the same time, house builders, current homeowners and property investors may limit the supply of housing onto the market with a view to instead selling later at a higher price, thereby increasing their profits in future.   [½]

So, the supply curve would shift to the left.   [½]

As both curves move upwards, the overall effect would be to increase prices. However, the effect on the quantity traded would be dependent on the magnitude of the shifts in supply and demand.
                                                                                                                [½]
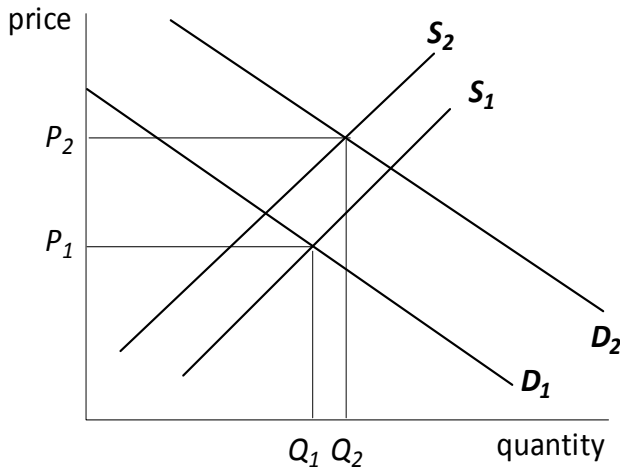
[1 for diagram that matches the explanation]
[Maximum 3]

(iii)   *An increase in the rate of taxation for house builders*

An increase in taxes for house builders would increase their costs.   [½]

So, the supply curve would shift vertically upwards by the amount of the tax levied.   [½]

As a result of the tax increase, the prices of new houses in particular, and houses in general, would increase, and the quantity of houses traded would fall.   [1]
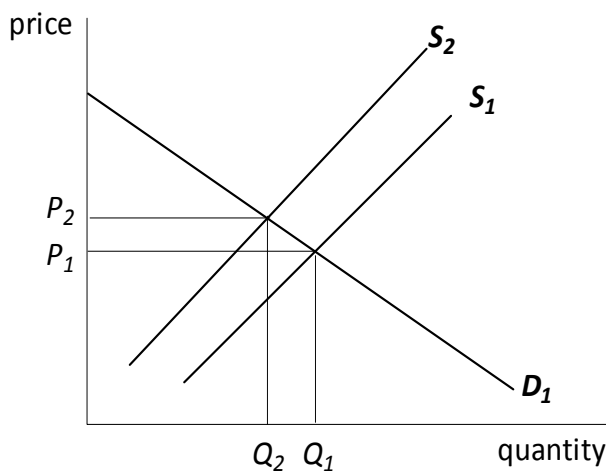
[1 for diagram]
[Total 3]

Solution X1.38

Markers, please reward genuine comparisons, rather than two separate lists.
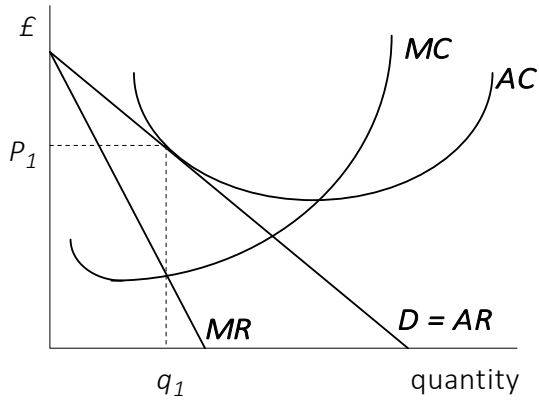
Long-run equilibrium in monopolistic competition
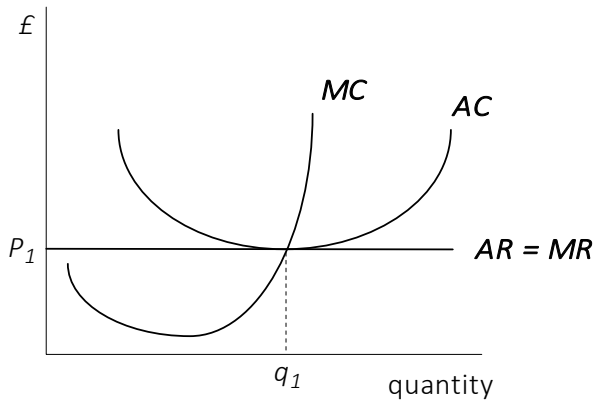
Long-run equilibrium in perfect competition

[1 for each correct diagram, less ½ for each error]

Competitive conditions

Both perfect competition and monopolistic competition are characterised by:

- a large number of small firms, and   [½]

- free entry and exit into the industry.   [½]

Profit maximisation

In both cases firms are assumed to maximise profits, and thus set q_1, their equilibrium level of output, such that $MR = MC$.   [½]

Profit in the long run

The assumption of free entry and exit of firms means that firms in both structures will make normal profits in the long run, ...   [½]

... ie they produce at the level of output where *AR = AC*, which is the point where the demand curve is a tangent to the *AC* curve.   [½]

Shape of the demand curve

Perfect competition is distinguished from monopolistic competition by the additional assumptions that consumers have perfect information, and that firms produce a homogeneous product.   [½]

Under these assumptions, if one firm is trying to sell its output at a higher price than all other firms, it will lose all its customers.   [½]

The implication of this is that an individual firm can sell as much output as it likes at the market price, but none at all above that price.   [½]

Thus firms are *price takers* and face a horizontal demand curve so that *MR = P*.   [½]

In monopolistic competition, the output of firms is differentiated in some way.   [½]

This gives firms some ability to affect the price that they charge, because they will not lose all their customers if they raise their prices.   [½]

Firms in this type of industry are therefore *price makers* and face a downward-sloping demand curve.   [½]

Average cost

In the long run, firms in perfect competition produce at the lowest point on the *AC* curve, ...   [½]

... since this is the point where $MC = MR = AR = AC$.   [½]

However, in monopolistic competition, firms produce to the left of the lowest point on the *AC* curve (so they have *excess capacity*).   [½]

Therefore, assuming they have the same cost curves, firms under monopolistic competition sell a lower output at a higher price than firms under perfect competition.   [½]

Social optimum

Finally, as *P = MC* in equilibrium for a perfect competitively firm, it produces at the socially optimal output level, ...   [½]

... whereas under monopolistic competition, the equilibrium is such that *P > MC* and the firm therefore produces less than the socially optimal output level.   [½]

[Maximum 10]

Markers: This document sets out one approach to solving each of the questions. However, please:

- *give credit for other valid approaches*

- *award full marks for the correct answer to calculation questions, with or without working, but in the case of an incorrect final answer, please award method marks as given.*

Answers to multiple-choice questions

The following table gives a summary of the answers to the multiple-choice questions. The answers are repeated below with explanations.

1	B		**10**	B		**19**	B
2	B		**11**	D		**20**	C
3	D		**12**	D		**21**	B
4	D		**13**	D		**22**	B
5	C		**14**	C		**23**	B
6	B		**15**	C		**24**	B
7	B		**16**	A		**25**	C
8	C		**17**	D		**26**	A
9	C		**18**	C			

Solution X2.1

Option B.

Social efficiency is a situation of Pareto optimality by definition. Statement II describes a situation where no Pareto improvements can be made, which in turn describes a situation of Pareto optimality. Statement III describes the output level at which social efficiency is achieved.   [1½]

Solution X2.2

Option B.
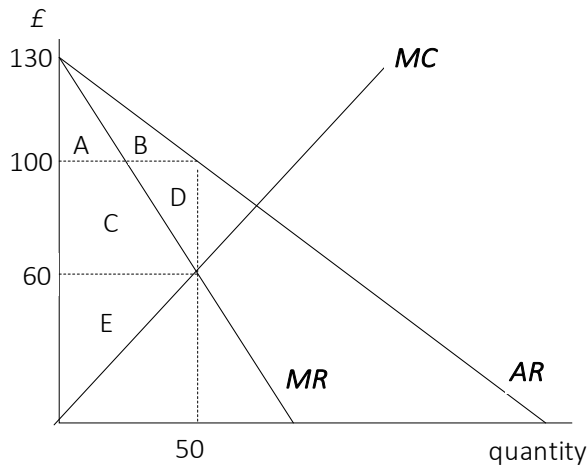
The *consumer surplus* is equal to total utility *less* total expenditure. On the diagram above it is represented by the areas marked A and B.

The *producer surplus* is the surplus revenue received over the minimum required to supply the good, *ie* total revenue *less* total variable costs (which are represented by the area under the marginal cost curve). On the diagram above it is represented by the areas marked C, D and E.

In this instance the profit-maximising price and output are 100 and 50 respectively. So, the consumer surplus is equal to:

$$½ \times (130 - 100) \times 50 = 750$$

Whereas the producer surplus is equal to:

$$(100 - 60) \times 50 + ½ \times 60 \times 50 = 3,500 \hspace{2cm} [1½]$$

Solution X2.3

Option D.

The two key characteristics of public goods are that they are *non-rival* and *non-excludable*. Merit goods are private goods in that they are both rival and excludable.

Option D describes the non-rivalry characteristic of public goods, whereas Option B attributes non-excludability to merit goods rather than public goods. [1½]

Solution X2.4

Option D.

The effect of the subsidy *paid to firms* is to shift the supply curve vertically *downwards* by the amount of the subsidy, *ie* 5. We would therefore expect the market price to fall and the quantity traded to increase.

Consumers are not affected directly by the subsidy paid to firms and so the demand function doesn't change. However, if *P* is the market price, then the effect of the subsidy is that firms will now base their supply decision on the market price *plus* the subsidy, *ie* $P + 5$, rather than *P*.

So, to find the new equilibrium market price and quantity we equate the *original* demand curve with the *revised* supply based on $P + 5$:

$$\tfrac{1}{2}(P + 5) = 40 - 2P$$

From which the market price is:

$$P^* = 15$$

Substituting this into the demand function gives the equilibrium quantity as:

$$Q^* = 10$$

Given that the subsidy is 5 per unit on each of these 10 units, the overall cost of the subsidy must be:

$$\text{cost} = 10 \times 5 = 50 \qquad\qquad\qquad\qquad [1\tfrac{1}{2}]$$

Solution X2.5

Option C.

Collusion involves firms *agreeing to limit competition* between themselves. The following are examples of collusion:

- horizontal price fixing (Option A), where firms agree to set their prices at a level above the competitive price

- agreements to limit production to keep supply low (Option B), which should result in higher prices

- sharing out sources of supply (Option D), which involves the firms agreeing who will use which suppliers, and should avoid situations in which input prices are bid up as a result of competition for raw materials / other inputs.

In contrast, if a firm increases its R&D (Option C), it will benefit from improved products and/or lower production costs, which is to the *detriment* of other firms. [1½]

Solution X2.6

Option B.

Statement I is the invention stage. Statement II is the diffusion stage. Statement III is the innovation stage. [1½]

Solution X2.7

Option B.

The difference between net national income (NNY) and gross national income (GNY) is depreciation (*ie* the reduction in value of capital goods due to wear and tear and obsolescence), which must always be positive. Thus Statement II is always true. NNY at basic prices is obtained from NNY at market prices by deducting taxes on goods and adding on subsidies. So Statement III is true in this case. GNY is obtained from gross domestic product (GDP) by adding on net income from abroad, so Statement I may or may not be true, depending whether net income from abroad is negative or positive. [1½]

Solution X2.8

Option C.

French aggregate demand (*ie C + I + G + X − M*) refers to demand from *anyone* for French goods and services. The '*− M*' term means that aggregate demand includes only demand for French goods and services (*ie* it excludes the demand for goods from other countries), and the inclusion of the *X* term means that aggregate demand measures demand from both France and other countries. [1½]

Solution X2.9

Option C.

The aggregate demand (*AD*) curve is downward sloping, *ie* as the price level increases, *AD* falls. This reflects:

- three *substitution effect*s (the inter-temporal substitution effect, the real balance effect, and the international substitution effect (Options A, B and D respectively)) as consumers and firms switch from domestic consumption and investment to savings and/or imports

- an *income effect* as consumers' purchasing power falls – assuming incomes do not increase in line with prices (Option C). (Although firms' profit might benefit from falling real wages, investment is unlikely to increase while consumer spending is falling.) [1½]

Solution X2.10

Option B.

For equilibrium, planned injections must be equal to planned withdrawals, so:

$$J = W$$
$$I + G + X = S + T + M$$
$$200 + 250 + 100 = 300 + T + 150$$
$$550 = 450 + T$$
$$T = 100 \qquad \text{[1½]}$$

Solution X2.11

Option D.

Structural unemployment occurs when there is a change in the structure of the economy. This may arise from changes in demand, *eg* a decline in the demand for coal, or a change in the method of production. People find themselves out of work and lacking the skills they need to get a new job in a different area of work. More government funds for retraining of the unemployed (Option D) would help to overcome these problems and hence might reduce the level of structural unemployment.

Although Options B and C would ease the monetary circumstances of the unemployed, it would not help them to find new jobs. In fact, raising unemployment benefit is likely to *reduce* the incentive to work and so *increase* unemployment.

Lowering the rate of interest (Option A) would increase aggregate demand and hence reduce *demand-deficient unemployment*. [1½]

Solution X2.12

Option D.

A *consumer prices index* measures changes in the average level of the retail prices paid by consumers. It therefore measures changes in the average cost of living (Option D). It does not measure changes in the standard of living (Option B) because it does not take into account other factors that affect the standard of living such as income and the quality of life.

Consumer spending relates to the total quantity of goods consumed, rather than just the prices of those goods (Option A) and changes in average earnings would be measured by an earnings index (Option D). [1½]

Solution X2.13

Option D.

De-trending techniques smooth the actual GDP figures to try to estimate potential output and hence the output gap (Option A).

Businesses can be surveyed in order to create estimates of rates of capacity utilisation and hence potential output and the output gap (Option B).

A production function approach estimates potential output and hence the output gap using statistics on capital stock, labour and productivity (Option C).

However, a production possibility curve (Option D) shows the possible combinations of two goods that can be produced by a country in a given time period and does not relate to output gaps. [1½]

Solution X2.14

Option C.

The terms of trade index is defined as:

$$\text{terms of trade index} = \frac{\text{average price of exports}}{\text{average price of imports}} \times 100$$

One way to tackle a question like this is to think of a simple numerical example. Here, let's say that we start with the prices of Good X and Good Y both being £100. The terms of trade index will then be 100.

A 40% increase in the price of Good X gives a new average price of exports of £140.

A 30% fall in the price of Good Y gives a new average price of imports of £70.

The terms of trade index for Country A is now 200, which is an increase of 100%.   [1½]

Solution X2.15

Option C.

Country A has an absolute advantage in both goods as it can produce more of both goods with the same resources, *ie* one hour of labour.

The opportunity cost of producing 10 units of Good X for Country A is the 5 units of Good Y it could have produced instead. Therefore the opportunity cost of 1 unit of Good X for Country A is ½ a unit of Good Y. Similarly, the opportunity cost of producing 1 unit of Good X for Country B is ⅓ of a unit of Good Y. This is lower, so Country B has the comparative advantage in producing Good X.   [1½]

Solution X2.16

Option A.

Options B and C are *outflows* on the financial account. Option D is an *outflow* on the current account. These are recorded as *minuses*. Option A is an *inflow* on the current account and is therefore recorded as a *plus*.   [1½]

Solution X2.17

Option D.

An increase in the value of sterling makes imports *cheaper* in pound terms (so Statement I is *not* true), *improving* the UK's terms of trade (so Statement III *is* true). The volume of exports is likely to *fall* as they will now be more expensive (so Statement II is *not* true).   [1½]

Solution X2.18

Option C.

Strategy, structure and rivalry of firms is one of Porter's four key determinants of why nations have a competitive advantage in some products. The other determinants are *available resources*, *demand conditions in the home market*, *related and supporting industries*.

The fourth limit to trade is that *factors of production rather than goods may move from country to country*.   [1½]

Solution X2.19

Option B.

Loans and advances to customers are amongst the most profitable of banks' assets. However, they are relatively illiquid. The other assets mentioned in the question are all liquid assets of banks that typically offer low returns.   [1½]

Solution X2.20

Option C.

Securitisation is the process of pooling assets such as loans and mortgages into marketable securities such as bonds. It is a form of *secondary marketing*, *ie* the sale of assets before maturity.   [1½]

Solution X2.21

Option B.

The *capital adequacy ratio* (CAR) is the ratio of a bank's capital (shares and reserves) to its risk-weighted assets. So, an increase in the riskiness of a bank's assets will result in an *increase* in its risk-weighted assets and a *decrease* in its CAR.

The *liquidity ratio*, which is the proportion of a bank's total assets held in liquid form, will be unaffected. (In practice, banks might decide to hold a higher liquidity ratio if they feel there is increased danger of bad debt.)   [1½]

Solution X2.22

Option B.

Prudential control refers to the insistence by the Bank of England that each individual bank maintains sufficient liquidity (so Option B is the correct answer). It applies to all banks, including those deemed to be *global systemically important*, *ie* so large that their failure could impact the global financial system. So, Option D is not correct.

Macro-prudential regulation is concerned with the financial health of the banking system as a whole, *ie* with ensuring that the banking system as whole has sufficient liquidity and capital, and so doesn't impact adversely on the wider economy. So, Option A is not correct.

The ratio of a bank's share capital and reserves to its risk-weighted assets is its *capital adequacy ratio* (so Option C is not correct). This is intended to ensure that the bank has sufficient capital to withstand defaults on its assets (bank loans, personal loans, mortgages *etc*).   [1½]

Solution X2.23

Option B.

Unlike government bonds, Treasury bills form part of the liquid assets of banks and are therefore used as a basis for credit creation. So, if the government chooses to fund its borrowing by issuing more bonds and fewer Treasury bills (Option B), this is likely to restrict the banks' ability to create credit and hence *worsen* the cash position of banks.

If the central bank buys government bonds or Treasury bills before maturity from banks (Options A and C), this provides them with cash. Buying Treasury bills before maturity is also known as *rediscounting* (Option D).   [1½]

Solution X2.24

Option B.

Increased expectations of price rises mean that consumers and firms will want to bring forward their purchases so as to buy goods and assets before their prices increase. Hence, they will be left holding hold lower money balances now. So, Option B is the correct answer.

An increase in *actual prices* means consumers and firms will need higher money balances in order to buy the (same volume of) more expensive goods (Option A).

A reduction in the use of credit cards (Option C) means people will be paying for goods and services more frequently, as opposed to once at the end of each month, and consequently will need higher money balances in order to do so. In addition, more money will need to be held for precautionary purposes.

A switch from weekly payment to the monthly payment of wages (Option D) means people will need to hold higher money balances to cover outgoings until the next payment of wages.   [1½]

Solution X2.25

Option C.

In order to try and reduce inflation, the central bank will want to try and *reduce* the money supply. (In practice, it will likely aim to reduce the rate of growth of the money supply.)

Buying government bonds from banks, as part of a programme of *open market operations*, would *increase* the cash in the banking system, enabling banks to *increase* their lending, resulting in an *increase* in the money supply. So, Option C is the correct answer.

In contrast, each of the other three measures will *reduce* the money supply. For example, introducing a minimum reserve, or liquidity, ratio for banks (that is higher than the reserve, or liquidity, ratio they would choose themselves) would reduce the amount of credit they could create from a given amount of cash and hence would *reduce* the broad money supply. So, Option A isn't the correct answer.

Likewise, knowing that the central bank is less willing to lend to them should they run short of cash (Option B) would encourage banks to hold more cash themselves, *ie* to choose to operate with higher liquidity ratios, leading to less credit creation.

Funding government borrowing by selling more long-term, illiquid government bonds and fewer short-term, liquid Treasury bills (Option D) means banks would hold fewer liquid assets that could be used as the basis for credit creation. This would again lead to less bank lending and a lower money supply.   [1½]

Solution X2.26

Option A.

Note that Option C is the policy remit of the US Federal Reserve Bank. [1½]

Solution X2.27

Markers: please give credit for similar points made using different bases for comparisons.

GDP

GDP in Country B is 20% higher than GDP in Country A; and GDP in Country C is 20% lower than GDP in Country A. [½]

So, in terms of GDP alone, $B > A > C$, with Country B being 20% better off than Country A and 50% better off than Country C. [½]

GDP per head

GDP per head is only 10% higher in Country B than in Country A; and GDP per head in Country C is only 10% lower than it is in Country A, … [½]

 … which tells us that Country B has a bigger population than Country A; and Country C has a smaller population than Country A. [½]

So, having allowed for population, the rank order is the same, but the differential is smaller, with Country B being 10% better off than Country A and just over 22% better off than Country C. [½]

GDP (PPS) per head

When the PPP exchange rates are used rather than the actual exchange rates, the differential closes further, though the rank order is still the same. [½]

The figures tell us that, although the GDP per head is 10% higher in Country B than in Country A, the average person in Country B could buy only 5% more than the average person in Country A, … [½]

 … so prices are higher in Country B than they are in Country A. [½]

Similarly, although GDP per head is 10% lower in Country C than it is in Country A, the average person in Country C could buy only 5% less than the average person in Country A, … [½]

 … so prices are higher in Country A than they are in Country C. [½]

So, using the GDP figures available, Country B would seem to be 5% better off than Country A and nearly 11% better off than Country C. [½]

Index of well-being

However, according to the index of well-being, Country C's score is 5% higher than Country A's score; and nearly 24% higher than Country B's score, giving a completely opposite rank order. [½]

The index of well-being could include indicators of health, education, crime, personal finance, the environment, job satisfaction, inequality, leisure time (*vs* work time) and social capital (*ie* social connections that affect the cohesiveness of societies). [½]

This could indicate that Country B's higher GDP has been obtained at some cost to its citizens, *eg* working longer hours, and that Country C's citizens are compensated for the lower GDP by other aspects of life, *eg* high-quality healthcare. [½]

[Maximum 5, with a maximum of 2 for each statistic]

Solution X2.28

(i)   *An increase in the cost of raw materials*

An increase in the cost of raw materials (such as oil, copper and steel), increases production costs and distribution costs … [½]

 … so the aggregate supply curve shifts upwards to the left. [½]

[1]
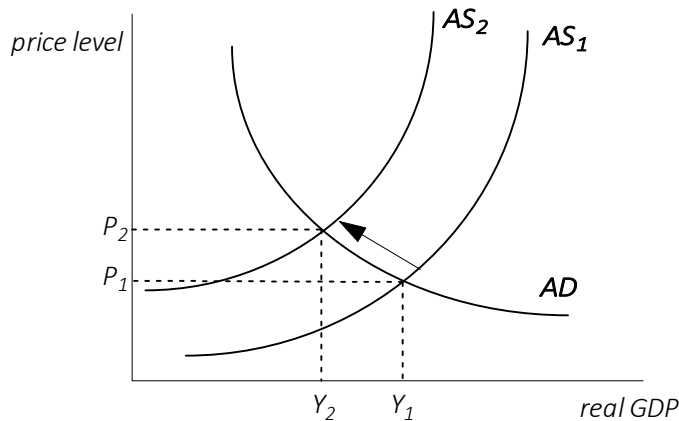
As can be seen in the diagram, the excess of aggregate demand over aggregate supply at the original price will lead to an increase in the general price level (from p_1 to p_2), … [½]

 … a consequent contraction of aggregate demand (*ie* a leftward/upward movement along the aggregate demand curve) … [½]

 … and hence a fall in the level of real GDP (from Y_1 to Y_2). [½]

[Maximum 3]

(ii)   *An increase in income tax*

An increase in income tax reduces disposable income and therefore reduces consumption. [½]

Consumption is a major component of aggregate demand and therefore the aggregate demand curve shifts to the left. [½]

[1]
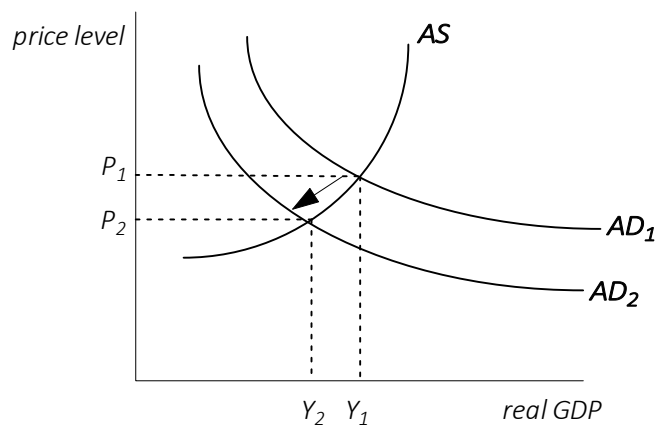
As can be seen in the diagram, the excess of aggregate supply over aggregate demand at the original price will lead to a fall in the general price level (from p_1 to p_2), …   [½]

… a consequent contraction of aggregate supply (*ie* a leftward/downward movement along the aggregate supply curve) …   [½]

… and hence a fall in the level of real GDP (from Y_1 to Y_2).   [½]

[Maximum 3]

Solution X2.29

Menu costs

When prices rise, firms incur menu costs, …   [½]

… *ie* the costs of changing prices in catalogues and menus, and of changing vending machines and tills.   [½]

Redistribution of income and wealth

When inflation is unexpectedly high, there is a redistribution of wealth from those with assets that provide rates of return below inflation to those with assets that increase in value at rates in line with or above inflation.   [½]

Inflation leads to a redistribution of income from those on fixed incomes to those whose income increases at rates in line with or above inflation.   [½]

Workers in weaker bargaining positions, *eg* those without trade unions, are likely to lose relative to those in stronger bargaining positions.   [½]

Uncertainty and lack of investment

Inflation makes it harder for firms to predict their revenues, costs and profits.   [½]

This leads firms to exercise greater caution when making production and investment decisions in uncertain times, especially when the government's reaction is also unpredictable.   [½]

This will reduce investment and the rate of economic growth.						[½]

Resources

There is a greater need for resources in the financial services industry, *eg* accountants and actuaries, to help businesses cope with the effects of inflation, especially the associated uncertainty.												[½]

This will divert resources from more productive uses.						[½]

Balance of payments

If domestic inflation exceeds that in other countries there will be a decrease in the demand for net exports …										[½]

… as domestic goods become less price-competitive and imports become more price-competitive.											[½]

This will lead to a deterioration in the balance of trade, and a fall in the exchange rate.		[½]

Hyperinflation

A rise in the rate of inflation to very high levels might cause dramatic reductions in savings and investment, the development of a barter economy …					[½]

… and the complete collapse of an economy and its currency.					[½]

[Maximum 4 for 4 effects]

Solution X2.30

The average duration of unemployment is determined by:

- the size of the stock of unemployment (the number of people unemployed) …		[½]

   … the higher the stock of unemployment, the longer the average duration of unemployment											[½]

- the rate of inflow and outflow from the stock of unemployment …			[½]

   … the higher the rates relative to the stock of unemployment, the shorter the average duration of unemployment										[½]

- the phase of the business cycle …							[½]

   … at the start of a recession, the average duration of unemployment is likely to be relatively short; it is likely to increase with the length of the recession.			[½]

[Total 3]

Solution X2.31

(i)   *Definitions*

Country A has an *absolute advantage* over Country B in producing a good when Country A can produce a unit of that good using fewer resources than Country B.   [1]

Country A has a *comparative advantage* over Country B in producing a good when Country A has a lower opportunity cost of producing that good than Country B.   [1]

(ii)   *Abundant factors and their impact on trade*

Factors of production that are abundant tend to be relatively cheap.   [½]

The low price of abundant factors can give the country a comparative advantage (CA) in the production of goods that rely upon these factors.   [½]

CA is most likely to occur for goods that require intensive use of the (relatively cheap) abundant factors.   [½]

Trade is likely to lead to higher levels of use of these abundant factors, which is likely to cause their price to rise.   [½]

Therefore, trade is likely to lead to greater equality of factor prices between countries.   [½]

[Maximum 2]

(iii)   *Comparative advantage in Good X*

In Country A the opportunity cost of producing one unit of Good X is four units of Good Y. In Country B the opportunity cost of producing one unit of Good X is two units of Good Y ...   [½]

... so Country B has the comparative advantage in the production of Good X.   [½]

(iv)   *Absolute advantage in Good X*

In Country A it takes twenty hours to produce one unit of Good X. In Country B it takes thirty hours to produce one unit of Good X, ...   [½]

... so Country A has the absolute advantage in the production of Good X.   [½]

(v)   *Would trade take place?*

International trade would not take place ...   [½]

... because both countries will gain from trade only if the terms of trade were between two and four units of Good Y for one unit of Good X.   [½]

Alternatively, based on the opportunity costs, Country A will trade only if it can buy one unit of Good X for fewer than four units of Good Y, whilst Country B will trade only if it receives more than two units of Good Y for each unit of Good X.   [½]

Solution X2.32

Markers, please award full marks for correct answers, even if there is no working, but in the case of an incorrect answer, please award method marks as given.

(i)   **Current account balance**

	=	net exports of goods and services	
		plus net income flows from abroad	
	=	120 – 140 + 40 + 30 – 20	[½]
	=	£30*m* surplus	[½]

Note that exports of goods on trade credit should be included as an export in the current account balance, however, it should also be included as a negative item in the financial account (see below), so that its total contribution to the overall balance of payment account is zero.

(ii)   **Financial account balance**

	=	net inflow of investments and loans and flows to and from the reserves	
	=	– 40 + 30 – 20	[½]
	=	£30*m* deficit	[½]

Remember that an increase in official reserves means an increase in the supply of the country's currency, ie a 'negative' in the financial account. Also note that trade credit is recorded as a negative item since it is effectively a loan to the purchasing countries, which enables them to buy the exported goods.

(iii)   **Net errors and omissions**

Using:

current account + capital account + financial account + net errors and omissions

= 0

30 – 10 – 30 + net errors and omissions	= 0	[½]
$\Rightarrow$ Net errors and omissions	= +£10*m*	[½]

Solution X2.33

Markers, please award full marks for correct answers, even if there is no working, but in the case of an incorrect answer, please award method marks as given.

(i)(a)   ***Value of the money multiplier and the broad money supply***

The money multiplier, m, is equal to:

$$m = \frac{1+c}{r+c}$$

where r is the bank's reserve, or liquidity, ratio and c is the proportion of the public's money held as cash outside of the banking system. Here r = 0.125 and c = 0.

The value of the money multiplier is:

$$m = \frac{1+c}{r+c} = \frac{1+0}{0.125+0} = 8$$ [½]

Alternatively, if the public holds all its money in bank accounts, the money multiplier m is the same as the bank deposits multiplier, b:

Therefore:

$$m = b = \frac{1}{L} = \frac{1}{0.125} = 8$$ [½]

where L = 0.125 is the banks' reserve, or liquidity, ratio.

Using the definition 'broad money supply = monetary base × money multiplier' we have:

broad money supply = 100×8 [½]

$= \$800m$ [½]

(i)(b)   ***Revised value of the broad money supply***

The revised value of the money multiplier is:

$$m = \frac{1+c}{r+c} = \frac{1+0}{0.10+0} = 10$$ [½]

and the revised value of the broad money supply:

broad money supply = 100×10 [½]

$= \$1,000m$ [½]

[Total 3]

(ii)(a)   *Effect on the value of the money multiplier if the public hold money outside of the banking system*

If the public decides to hold more of their money as cash outside of the banking system, the money multiplier would decrease ...   [½]

... because the banks would receive less in deposits and would be able to create less credit.   [½]

(ii)(b)   *Revised values of the money multiplier and the broad money supply*

The revised value of the money multiplier is:

$$m = \frac{1+c}{r+c} = \frac{1+0.20}{0.10+0.20} = 4$$ [½]

and the revised value of the broad money supply is:

$$4 \times 100 = \$400m$$ [½]

[Total 2]

Solution X2.34

(i)   *The money market*
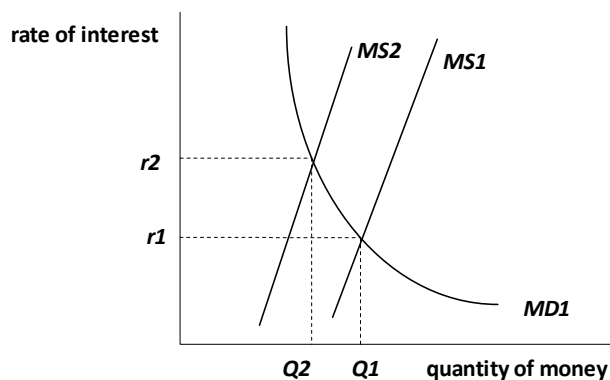
[1 for a correct diagram (*MS2* not necessary), less ½ for each error]

The diagram above shows the money supply (*MS1*) and money demand (*MD1*). Equilibrium occurs where the interest rate *r1* is at the level where the money demand equals the money supply.   [½]

The central bank controls the monetary base, which is assumed to have a very large influence on the supply of money, and its actions will determine the position of the money supply curve.   [½]

However, an increase in interest rates:

- will typically increase banks' profit margins (the differential between lending and borrowing rates) and encourage banks to lend more for a given level of liquidity   [½]

- may lead depositors to switch savings from liquid sight accounts to less liquid time accounts, enabling banks to operate with less liquidity   [½]

- may attract additional deposits from other countries, allowing banks to lend more.   [½]

So, the money supply curve typically slopes upwards (rather than being vertical).   [½]

The money demand curve slopes downwards because as interest rates increase, the opportunity cost of holding savings in cash (rather than bonds and equities) increases ...   [½]

... and so people are more likely to hold their wealth as bonds and equities rather than cash.   [½]

[Maximum 3]

Note that the alternative to an endogenous money supply is an exogenous money supply, which is assumed to be determined solely by the authorities and would be illustrated by a vertical money supply curve.

(ii)   *The effect of a decrease in the money supply*

A reduction in the money supply is shown by a shift to the left of the money supply curve from *MS1* to *MS2*.   [½ for diagram]

At *r1*, there is excess demand for money so the equilibrium rate of interest rises to *r2*.   [½]

(iii)   *Effect of an increase in the money supply on the exchange rate and the current account of the balance of payments*

An increase in the money supply is likely to cause a *reduction* in the domestic exchange rate.   [½]

This is for the following three reasons:

1.   Part of the excess money balances will be spent on foreign assets, thereby increasing the supply of the domestic currency on the foreign exchange market.   [1]

2.   Domestic interest rates will fall below those on foreign assets, causing a reduction in the demand for domestic assets and hence a reduction in the demand for the domestic currency.   [1]

3.   Speculators will expect the domestic currency to fall, so they will sell it and buy foreign currencies.   [1]

The decrease in the exchange rate should then lead to an increase in exports, a decrease in imports and hence an improvement in the current account of the balance of payments.   [1]

[Maximum 4]

Note that the improvement in the current account of the balance of payments requires that export and import volumes are sufficiently elastic with respect to the value of the exchange rate, which is typically the case in practice. However, there may be a short-term worsening in the current account position before it ultimately improves, due to the J-curve effect.

Solution X2.35

A *financial intermediary* is a financial institution, *eg* a bank or building society, that acts as a means of channelling funds from lenders/depositors to borrowers.   [1]

The main services provided by financial intermediaries include:

*   providing *expert advice* to customers, on the best ways to save money and also how best to borrow it   [1]

*   using their *expertise to channel funds* to investments with the highest returns relative to the risk involved, so ensuring the most efficient use of investment funds   [1]

*   *maturity transformation*, *ie* borrowing funds from savers in the form of short-term deposits and lending the money to borrowers on a long-term basis, *eg* via mortgages and personal loans   [1]

*   *risk transformation*, *ie* by lending to a large number of borrowers, they are able to spread the risk of default   [1]

*   the *transmission of funds*, *ie* they provide alternative means of making payments, such as internet banking and credit cards.   [1]

[Maximum 5]

Solution X2.36

(i)   ***Why pollution causes a misallocation of resources***

In a free market, firms aim to maximise profits by considering their private costs and their private revenues.   [½]

They do not consider the effects of their production on third parties who are not directly involved in the transaction (*ie* external costs and benefits).   [½]

Assuming a perfectly competitive market, the free market equilibrium occurs where supply is equal to demand, (*ie* $MPC = \text{price}$). In the following diagram, this occurs at Q_F.   [½]
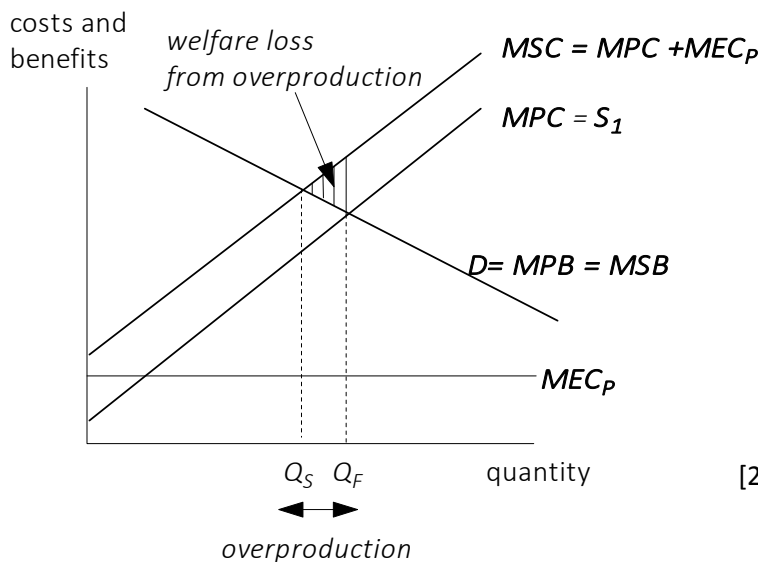
[2 for diagram, less ½ for each error]

However, if the industry's production causes pollution, this imposes costs on society, *eg*, air pollution causes respiratory illnesses and hence distress and health costs.   [½]

When these external costs of production (shown by MEC_P) are added to the private costs of production, we can see that the marginal *social* cost of production exceeds the marginal *private* cost of production.   [½]

The socially optimal output level, at which *MSB = MSC*, is therefore equal to Q_S …   [½]

… and so the free market results in overproduction of $Q_F - Q_S$ …   [½]

… and a consequent loss of social welfare equal to the shaded area on the diagram.   [½]

[Maximum 5]

(ii)   ***Comparing taxes and legislation as a means of correcting market failure***

Markers, please reward direct comparisons more highly than a separate analysis of each policy.

Taxation is a market-based solution that internalises the externality …   [½]

… to ensure that the polluter pays for the external costs.   [½]

If $MSC > MPC$, an indirect 'Pigouvian' tax (*ie* one that is equal to the marginal external cost at the social optimum) is imposed, to bring the private cost up to the social cost.   [½]

The tax increases private costs so that the profit-maximising output becomes the social optimum Q_S.   [½]
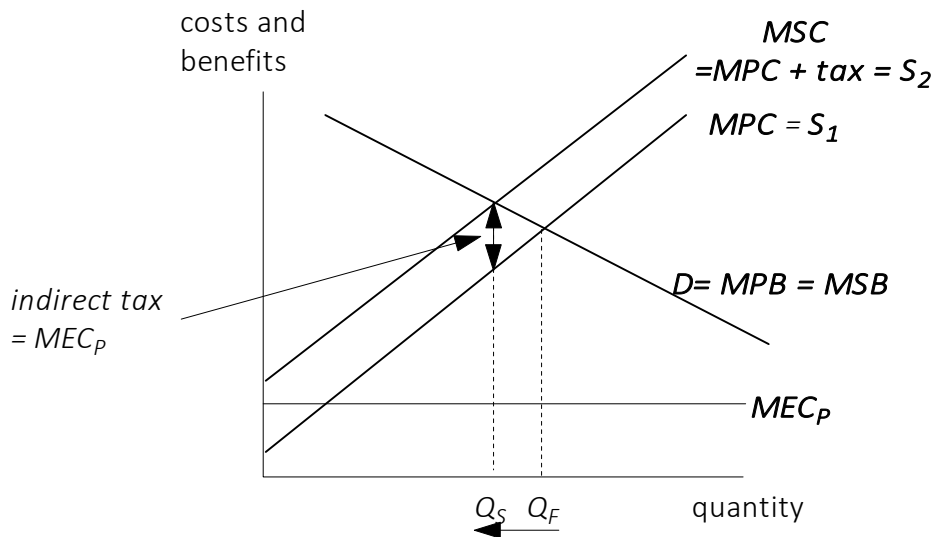
[½ for diagram or for reference to earlier diagram]

Legislation is a more traditional way of dealing with environmental problems. Laws can:

- *prohibit* certain products or processes, *eg* the use of single-use plastic containers and bottles   [½]

- *restrict* behaviour, *eg* by setting standards (*eg* maximum emission levels) and imposing punishments on firms that do not meet these standards   [½]

- *regulate* behaviour, *eg* by setting up regulatory bodies to investigate cases of pollution, to report on their findings and recommend action.   [½]

The advantages of taxation over legislation include the following:

1.   Taxation policy works within the market mechanism, whereas restrictions replace the market to some extent.   [½]

     Firms are therefore still free to make their own decisions when taxation is used.   [½]

2.   If the tax is equal to the marginal external cost, the result is the socially optimal level of output.   [½]

     This may be more difficult to achieve via legislation.   [½]

3.   Taxation provides incentives to introduce cleaner technology and reduce pollution whereas restrictions do not.   [½]

     For example, a company will pay less in carbon tax, if it lowers its emissions of carbon dioxide by using cleaner processes and fuels. On the other hand, if legislation sets a 'safe' maximum for emissions, there is no incentive to reduce them below this.   [½]

4.   Taxation has an immediate effect on costs and so firms are likely to change their behaviour quite quickly, ...   [½]

     ... whereas some firms might resist legal changes if they feel (a) they will not be caught and (b) the fines are manageable.   [½]

     This means that an efficient regulatory system must lots of inspectors who make unexpected visits and impose large fines.   [½]

5.   Taxes (net of administrative expenses) earn revenue for the government, ...   [½]

     ... which could be used to subsidise 'green' energy ...   [½]

     ... whereas regulatory systems involving inspections can be expensive to operate (though they can earn revenue from fines).   [½]

The advantages of legislation over taxation include the following:

1.   Restrictions are simple, clear and easy to administer, whereas taxation can be complex.
                                                                                                                                  [½]

2.   Restrictions, especially prohibitions, are safer than taxation when the danger is great,
        eg the use of asbestos.   [½]

3.   Restrictions can be quickly implemented in the case of an emergency, whereas it would
        take time for firms to respond to changes in taxation.   [½]

4.   Restrictions do not require the precise measurement of the external costs of production,
        whereas this is essential if taxation is to work efficiently.   [½]

Ideally, a policy should distinguish between different firms and different pollution problems. Both
taxation and regulation go some way towards achieving this.   [½]

For example, taxes can be higher on more polluting products or processes, *eg* diesel *vs* petrol ...
                                                                                                                                  [½]

... and similarly, regulatory bodies that adopt a case-by-case approach can adopt the most
appropriate remedy for each firm.   [½]

However, under the taxation system, it is sometimes impractical and sometimes impossible to
determine appropriate rates for each firm ...   [½]

... and likewise, it is expensive to provide a regulatory system that can cope with the different
requirements of each firm.   [½]

In conclusion, we can see that both taxation and legislation have their merits. It seems inevitable
that both will play their part in pollution policy.   [½]
                                                                                                              [Maximum 10]

Markers: This document sets out one approach to solving each of the questions. However, please:

- *give credit for other valid approaches*

- *award full marks for the correct answer to calculation questions, with or without working, but in the case of an incorrect final answer, please award method marks as given.*

Answers to multiple-choice questions

The following table gives a summary of the answers to the multiple-choice questions. The answers are repeated below with explanations.

1	A
2	D
3	D
4	D
5	C
6	C
7	C
8	B
9	C

10	D
11	C
12	D
13	C
14	A
15	A
16	D
17	A
18	C

19	A
20	B
21	A
22	B
23	B
24	B
25	D
26	D

Solution X3.1

Option A.

If aggregate demand exceeds actual output, then firms' stocks will fall, as they are used up to meet the excess demand for goods and services over and above current actual output.

In addition, if aggregate demand exceeds actual output, then factor incomes will increase. This will lead to a further increase in expenditure in subsequent time periods, leading in turn to a further increase in income. The end result will be a multiplied increase in national income.   [1½]

Solution X3.2

Option D.

The multiplier can be written in terms of marginal propensities as:

$$k = \frac{1}{1 - mpc_d} = \frac{1}{mpw} = \frac{1}{mps + mpt + mpm}$$

Hence, it can be seen that the multiplier will increase as a result of an *increase* in the marginal propensity to consume domestically produced goods, or equivalently, as a result of a *decrease* in any of the marginal propensities to withdraw expenditure from the circular flow of income (*ie* savings, taxes or imports). Therefore Option D is correct.   [1½]

Solution X3.3

Option D.

The *inflationary gap* is defined as the amount by which aggregate demand (or aggregate expenditure) exceeds national income (or output) at the full-employment level of national income (or output). The *recessionary* or *deflationary gap* is defined as the amount by which aggregate demand is deficient (*ie* is less than national income) at the full-employment level of national income.

At the full-employment level of income Y_F, the level of aggregate demand or aggregate expenditure E exceeds the level of national income by ab, so this must be an inflationary gap.

                                                                                                  [1½]

Solution X3.4

Option D.

The quantity theory of money is based on the equation of exchange, *ie* $MV = PY$. The theory assumes that real output (Y) and the velocity of circulation (V) are constant, therefore the ratio of the money supply (M) to the price level (P) is fixed.   [1½]

Solution X3.5

Option C.

Under the gold standard, currencies were fixed in terms of a certain weight of gold and therefore with each other. If a country experienced an increase in imports causing a balance of payments deficit, it would be paid for in gold from its reserves (so Option C is correct) and there would be an *outflow* of gold (so Option B is incorrect). Similarly, an increase in prices would make exports less competitive and imports more competitive, so would cause an *outflow* of gold (and therefore Option A is incorrect).

The domestic money supply was backed by gold, so an outflow of gold would also lead to a fall in the money supply. As a result of the quantity theory of money, it was believed that if the money supply fell, prices would fall to restore competitiveness (so Option D is incorrect).   [1½]

Solution X3.6

Option C.

According to the classical model, the decrease in aggregate demand in the goods market will shift the *AD* curve to the left and the price level will fall in the short run. As a result, the real wage will rise above w_1. For example, if it rose to w_2, there would be a movement along the demand and supply curves for labour resulting in an excess supply of labour of $c - b$. In the long run, wages are assumed to be fully flexible, so nominal wages would fall so that real wages return to the original equilibrium of w_1. Hence Option C is correct and Option D is not correct.

Note that in the classical model, the outcome described in Option A would occur if there was an *exogenous* reduction in the demand for labour, *eg* if there was a decrease in the productivity of labour, (rather than a change in prices causing a change in the real wage rate).

Option B describes the *Keynesian* view of the effect of a decrease in aggregate demand. The decrease in aggregate demand leads to a decrease in output (not prices) in the goods market. With unchanged prices and wages, real wages are unchanged. The decrease in demand for goods with unchanged real wages results in a shift of the demand curve for labour to the left, resulting in demand-deficient unemployment of $f - e$ to add to the equilibrium unemployment of $g - f$.

[1½]

Solution X3.7

Option C.

This question describes a situation actual unemployment is *below* its natural rate and actual inflation is *above* the expected level implied by the initial expectations-augmented Phillips curve.
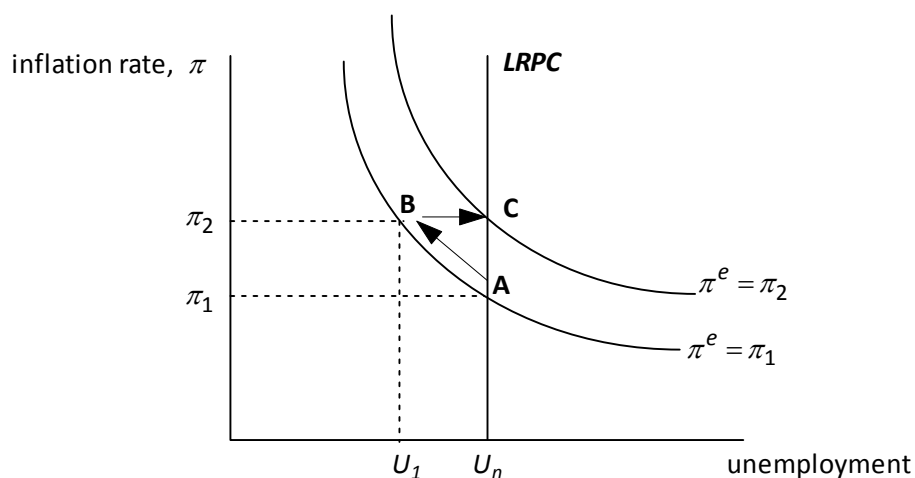
The question describes a situation where the economy is at position B in the diagram. (Note that the economy is initially at a point on an expectations-augmented Phillips curve to the *left* of the vertical long-run Phillips curve – perhaps because the government has recently increased the rate of monetary growth (so causing a movement from A to B) and expectations have yet to fully adjust.)

As expectations of inflation are revised upwards in the light of experience, the expectations-augmented Phillips curve will shift upwards. Real wages will increase as workers negotiate new wage agreements. Firms' costs increase and output falls. The economy returns to the long-run vertical Phillips curve (from B to C) and unemployment returns to its higher natural rate.

Note that in the short-run, if real output increases, unemployment will generally decrease and vice versa. This rules out Options A and D.   [1½]

Solution X3.8

Option B.

The expectations-augmented Phillips curve models actual price inflation (π) as a function of:

- the *inverse of the unemployment rate* (*U*), as higher aggregate demand leads to higher inflation and lower unemployment

- the *expected rate of inflation* (π^e), which is determined using adaptive expectations (*ie* it reflects past inflation rates)

- exogenous (*ie* non-demand-related) *cost-push inflation* (*k*) due to factors such as commodity price increases.

Its equation is:

$$\pi = f(1/U) + \pi^e + k$$

Consequently, it will shift upwards if *expectations of inflation increase* (Option I) and also if *actual inflation increases due to cost-push pressures*, *eg* due to a rise in commodity prices (Option II). (*An increase in actual inflation could also arise from an increase in aggregate demand. This would lead to a movement along the Phillips curve upwards to the left.*)

The expectations-augmented Phillips curve slopes downwards because demand-pull inflation and demand-deficient unemployment are inversely related. Consequently, an increase in demand-deficient unemployment is associated with a fall in demand-pull inflation and a movement downwards along the curve, *not* a shift of the curve.   [1½]

Solution X3.9

Option C.

A fall in structural unemployment, and hence in equilibrium unemployment, will shift the Phillips curve to the *left* and not the right.

Clockwise Phillips loops *can* be used to explain the existence of *stagflation*, *ie* periods when both unemployment and inflation are rising (Option A).

The *adaptive expectations hypothesis* (Option B) suggests that expected inflation is based on past inflation. So, it will *over*-estimate inflation when inflation is consistently falling and likewise *under*-estimate inflation when inflation is consistently rising.

The *vertical long-run Phillips curve* (Option D) suggests that ultimately unemployment will always revert to its natural rate. Consequently, whilst a deflationary policy to reduce inflation will increase unemployment in the short run, there will be no long-term increase in unemployment.

[1½]

Solution X3.10

Option D.

An increase in the money supply will decrease interest rates and the fall in interest rates will increase investment (and aggregate demand and therefore output). An increase in the money supply will have a greater effect on real output the further interest rates fall and the more investment rises in response to the fall in interest rates.

Interest rates will fall further the more *interest-inelastic* the demand for money (*ie* the steeper the money demand curve) since a greater drop is needed to encourage people to hold more money. (*Try drawing the money market diagram to illustrate this.*) The more *interest-elastic* the demand for investment the greater the increase in investment in response to the fall in interest rates. [1½]

Solution X3.11

Option C.

Crowding out is a reduction in private sector expenditure following an increase in government borrowing. The main mechanism for this is an increase in interest rates, which leads to the effects in Options A, B and D.

Option C appears to make little sense. What we can say about it is that a *reduction* in import expenditure cannot be a crowding-out effect. To offset an increase in government expenditure we should be looking for a reduction in net exports.   [1½]

Solution X3.12

Option D.

A budget surplus occurs when tax receipts are greater than government spending, so there will be a net reduction of aggregate demand into the circular flow of income. Thus, there is a multiplied decrease in the level of national income associated with each given interest rate in the market for goods and services. Hence, the *IS* curve will shift to the left.

Since the government uses the tax receipts to buy back debt from the non-bank private sector, there will be no change in the money supply, and hence no movement in the *LM* curve, so the equilibrium level of short-term interest rates will decrease – as will equilibrium national income.

[1½]

Solution X3.13

Option C.

Nationally negotiated wage contracts tend to *increase* the power of labour because the entire workforce can take action to increase wages.

Conversely, locally negotiated wage contracts *decrease* the power of labour as each region is in competition for work. Local unions have less bargaining power than national unions.   [1½]

Solution X3.14

Option A.

The use of public-private partnerships is an example of a *market-orientated* supply-side policy since it is a way of funding public projects, such as new roads or hospitals, with private capital, following a competitive tendering process. The government pays the private company to run or maintain the facility, or pays it rent for the asset.   [1½]

Solution X3.15

Option A.

The neo-Austrian / libertarian school of thought advocates *maximum* liberty for economic agents to pursue their own interests and to own property.   [1½]

Solution X3.16

Option D.

A key advantage of a using implementing a Taylor rule is that it is operated by the central bank, which is committed to implementing the rule *without political interference*.

Option A is another potential advantage of implementing a Taylor rule. Options B and C are potential features of a Taylor rule.   [1½]

Solution X3.17

Option A.

An increase in government spending, *eg* on the health service, results in an immediate and direct increase in spending / aggregate demand. This will then be subject to a multiplier effect as part of the new income received by nurses, doctors, pharmaceutical companies *etc* is spent on domestically produced goods.

However, if the same amount were given in tax cuts, some of the increase in disposable income would be saved and some would be spent on imported goods, so the initial increase in spending (and hence income) would be less than the value of the tax cuts.

Consequently, the tax multiplier is smaller than the government spending multiplier.   [1½]

Solution X3.18

Option C.

Increasing the tax on consumer goods effectively increases their price to the consumer and is therefore likely to reduce the demand for such goods. Each of the other options will, however, increase aggregate demand.

[1½]

Solution X3.19

Option A.

Current expenditure refers to the operational expenditures of the public sector, including the wages of public sector staff and the payment of welfare benefits. It therefore includes the payment of wages to refuse collectors.

Capital expenditure refers to spending on public sector investments, *eg* on new school buildings or transport infrastructure.

Final expenditure is public sector spending on the goods and services that are consumed to meet the needs of firms and/or households, including refuse collections. It therefore includes the payment of wages to refuse collectors for their services.

Transfers refers to transfers of money from taxpayers to the recipients of benefits and subsidies.

[1½]

Solution X3.20

Option B.

Recall that actual injections of spending into the circular flow of income (investment (*I*), government spending (*G*) and exports (*X*) must equal actual withdrawals (net savings (*S*), net taxes (*T*), imports (*M*)). In other words:

$$I + G + X = S + T + M$$

This can be rearranged to give:

$$(X - M) = (T - G) + (S - I)$$

Plugging in the numbers given in the question and remembering that a budget *surplus* means that $T - G = 20$ gives:

$$(X - M) = 20 + (40 - 50)$$
$$= +10$$

So, the trade balance is $X - M = +10$, which represents a *surplus*, as Country A is exporting more than it is importing.   [1½]

Solution X3.21

Option A.

By definition, an *adjustable peg* is an exchange rate system in which rates are pegged (*ie* fixed) for a period of time but may be revalued or devalued in response to a substantial balance of payment surplus or deficit.

Under a *crawling peg* system, the exchange rate is pegged, but the peg rate is adjusted by small amounts at frequent intervals.

A *joint float* is where a group of currencies are pegged against each other but float against all other currencies.

Managed floating is where exchange rates are allowed to float, but central banks may intervene occasionally to prevent excessive fluctuations (such as happened during the financial crisis of 2008-09) or even to achieve an unofficial target.   [1½]

Solution X3.22

Option B.

It is the successful operation of a system of *fixed* exchange rates that requires sufficient *international liquidity*, *ie* a sufficient supply of currencies in the world acceptable for financing international trade and investment. In particular, it is important that international liquidity grows in line with international trade and investment, and hence the resultant current account deficits and surpluses, because countries' reserves need to be sufficient to maintain the fixed exchange rate.

The greater freedom of governments to implement their chosen domestic macroeconomic policy under freely floating exchange rates (Option D) follows directly from the fact that they are not constrained by the need to correct current account deficits because they will be corrected automatically (Option A).

An example of an *external shock* (Option C) is a world recession, which will lead to a fall in exports (and hence aggregate demand and GDP) and a current account deficit. Under a free-floating system, however, the exchange rate will fall, making exports cheaper and imports dearer, thereby boosting net exports, aggregate demand and GDP.   [1½]

Solution X3.23

Option B.

The five convergence criteria that each EU country had to meet in order to adopt the euro referred to its:

1.   inflation rate

2.   interest rates

3.   budget deficit

4.   national debt

5.   exchange rates.

They did not refer to unemployment.   [1½]

Solution X3.24

Option B.

European Monetary Union (EMU) is the adoption by a group of European countries of a single currency, a single central bank and a single monetary policy. Therefore, the loss of separate monetary policies is an inherent feature or principle of EMU. This loss of monetary policy is regarded as a disadvantage because it requires that all of the member countries must have similar interest rates, which may be appropriate for some countries but highly inappropriate for others.

Criticisms of the current design of EMU relate to the operation of monetary and fiscal policy in practice, especially following the financial crisis.   [1½]

Solution X3.25

Option D.

The paradox of thrift is associated with Keynes. He used it to criticise the classical economists' loanable funds theory. According to this theory, an increase in savings is good for the nation because its will lead to a fall in interest rates and an increase in investment. Keynes pointed out that, although saving might be good for an individual in that he or she will be able to consume more in the future, if society as a whole increases saving, consumption will fall and national income will fall. This will decrease the incentive to invest and income will fall still further.

This paradox is an example of the *paradox of aggregates* (or paradox of composition), which is concerned with the dangers of building on microeconomic foundations to develop macroeconomic theory, because what applies in an individual case does not necessarily apply when analysing aggregates. [1½]

Solution X3.26

Option D.

Sub-prime debt (Option A) is debt that carries a high risk of default, *eg* because the borrower is on a low income. Throughout the late 1990s and the early 2000s, banks dramatically increased their lending, and some of it, especially in the US, was in the form of sub-prime mortgages. This made the banks very vulnerable to a change in the financial position of the borrowers, *eg* if incomes or house prices fell.

Traditionally, banks obtained funds from customers in the form of customer deposits. However, as a result of deregulation and financial innovation, banks were able to obtain *wholesale funding* (Option B), which is funding from other financial institutions. The increased availability of funds led to a dramatic increase in bank lending, and a lot of this was risky lending.

In the case of insurance, *moral hazard* (Option C) refers to the danger of a change in behaviour resulting from being insured. In the case of banking, it was feared that banks were adopting risky behaviour partly in the belief that they would not be allowed to fail, *ie* they felt safe in the expectation that the government would bail them out if they suffered losses.

Counter-cyclical bank lending (Option D) would involve banks lending more when the economy is in recession and less when the economy is growing. In practice, bank lending tends to be *pro-cyclical*, *ie* banks feel optimistic in good times and are more likely to lend. Prior to the crisis, the economy had grown steadily for about 15 years and the expectation was that this would continue. Consequently bank lending grew rapidly. [1½]

Solution X3.27

(i)(a) *The withdrawals function*

Since $Y = C_d + W$, then:

$$W = Y - C_d$$

Autonomous consumption is \$5,000 and the marginal propensity to consume domestically produced goods out of national income is 0.6, so:

$$C_d = 5,000 + 0.6Y \qquad [\frac{1}{2}]$$

Therefore:

$$W = Y - (5,000 + 0.6Y)$$
$$= -5,000 + 0.4Y \qquad [\frac{1}{2}]$$

Alternatively:

Since $W = S + T + M$ and we are given that $T = 0.1Y$ and $M = 0.2Y$, then:

$$S = Y - C_d - T - M$$
$$= Y - (5,000 + 0.6Y) - 0.1Y - 0.2Y$$
$$= -5,000 + 0.1Y \qquad [\frac{1}{2}]$$

So $W = S + T + M = -5,000 + 0.1Y + 0.1Y + 0.2Y = -5,000 + 0.4Y$ $\qquad [\frac{1}{2}]$

(i)(b) *The equilibrium level of national income*

In equilibrium, aggregate demand (AD) or aggregate expenditure (E) is equal to aggregate supply or GDP (Y).

We know:

$$AD = C_d + I + G + X$$
$$= 5,000 + 0.6Y + 10,000 + 10,000 + 25,000$$
$$= 50,000 + 0.6Y$$

So equilibrium income occurs where:

$$Y = 0.6Y + 50,000 \qquad [\frac{1}{2}]$$

$$0.4Y = 50,000$$

$$\Rightarrow \qquad Y = 125,000 \qquad [\frac{1}{2}]$$

Alternatively, in equilibrium, planned injections (J) equal planned withdrawals (W), so:

$$J = W$$

$$I + G + X = -5,000 + 0.4Y$$

$$10,000 + 10,000 + 25,000 = -5,000 + 0.4Y \qquad [½]$$

Therefore:

$$50,000 = 0.4Y \quad \Rightarrow \quad Y = 125,000 \qquad [½]$$

(i)(c)   **The multiplier**

The multiplier k is calculated as follows:

$$k = \frac{1}{1 - mpc_d} = \frac{1}{1 - 0.6} \qquad [½]$$

$$= 2.5 \qquad [½]$$

Alternatively:

$$k = \frac{1}{mpw} = \frac{1}{0.4} \qquad [½]$$

$$= 2.5 \qquad [½]$$

[Total 3]

(ii)(a)   **The new equilibrium level of national income**

The new level of equilibrium income occurs where:

$$Y = C_d + I + G + X$$

$$= 5,000 + 0.6Y + 10,000 + 60,000 + 25,000$$

$$= 100,000 + 0.6Y \qquad [½]$$

So equilibrium income occurs where:

$$Y = 100,000 + 0.6Y$$

$$0.4Y = 100,000$$

$$Y = 250,000 \qquad [½]$$

Alternatively, using injections equal withdrawals:

$$J = W$$

$$I + G + X = -5,000 + 0.4Y$$

$$10,000 + 60,000 + 25,000 = -5,000 + 0.4Y \qquad [½]$$

Therefore:

$$100,000 = 0.4Y$$

$$Y = 250,000 \qquad \text{[½]}$$

Or, using the multiplier:

$$\Delta Y = k \times \Delta J$$

$$= 2.5 \times 50,000$$

$$= 125,000 \qquad \text{[½]}$$

Therefore, the new equilibrium national income will be the original value of Y plus the change in Y, ie $250,000. [½]

(ii)(b)   ***The effect on the government's budget and on the balance of payments***

Originally:

$$Y = 125,000, \ T = 0.1(Y) = \$12,500, \ G = \$10,000, \ \text{so } T - G = \$2,500$$

After the change:

$$Y = 250,000, \ T = 0.1(Y) = \$25,000, \ G = \$60,000, \ \text{so } T - G = -\$35,000$$

[½ for both calculations]

So the government's budget has moved from a *surplus* of $2,500 to a *deficit* of $35,000. [½]

Originally:

$$Y = 125,000, \ M = 0.2(Y) = \$25,000, \ X = \$25,000, \ \text{so } X - M = \$0$$

After the change:

$$Y = 250,000, \ M = 0.2(Y) = \$50,000, \ X = \$25,000, \ \text{so } X - M = -\$25,000$$

[½ for both calculations]

So the balance of payments has moved from a *balanced position* to a *deficit* of $25,000. [½]

[Total 3]

Solution X3.28

Hysteresis is the persistence of unemployment even when the initial demand deficiency that caused it no longer exists, *ie* the economy fails to 'spring back'.   [½]

According to the *new classical* group of economists, this should not happen because when a recession occurs in an economy, there is a self-righting mechanism to spring the economy quickly back to its potential level of output.   [½]

The mechanism is as follows:

- a fall in aggregate demand leads to a fall in the price level, so real wages rise   [½]

- a rise in real wages causes disequilibrium unemployment   [½]

- this results in a fall in nominal wages, which causes real wages to fall back to the equilibrium rate and the level of employment to return to its natural rate.   [½]

Assuming continuous market clearing and rational expectations, new classical economists believe this will happen virtually instantaneously.   [½]

Keynesian economists believe that prices and wages tend to be inflexible, and consequently hysteresis is likely.   [½]

The problem arises because:

- the decrease in aggregate demand will lead to a decrease in output (rather than prices) …

  [½]

   … and therefore a decrease in the demand for labour, which causes demand-deficient or disequilibrium unemployment   [½]

- real wages do not fall quickly, and therefore this unemployment persists.   [½]

In addition, there is a danger that a long recession could cause high unemployment to become embedded in the economy because: [½]

- the stock of human capital will be reduced as long-term unemployment reduces skills, confidence and motivation

- in an attempt to cut costs in a recession, firms will cut training and investment, which reduces productivity

- industrial capital that lies idle in a recession might be impossible or unattractive to re-use when the recovery comes.   [½ for an example]

This means that the potential output of the economy is reduced and the equilibrium or natural level of unemployment is increased.   [½]

[Maximum 5]

Solution X3.29

The traditional view is that the business cycle represents fluctuations in real GDP around the economy's long-run growth in potential output.   [½]

However, new classical economists argue that the business cycle is created by movements in potential output itself.   [½]

They argue that both the business cycle and long-term growth are affected by supply-side shocks or impulses …   [½]

 … such as technological shocks, *ie* anything that affects production processes and productivity.
                                                                                            [½]

These shocks are assumed to feed through the economy as rational consumers and producers make optimal choices, …   [½]

 … for now and the future, under assumptions of continuous market clearing.   [½]

These shocks therefore permanently affect the path of the economy's output over time.   [½]

For example, a positive shock, such as a technological breakthrough in medical engineering, will be an incentive for individuals to train and work more hours in this industry and for firms to invest in it, …   [½]

 … so leading to an increase in output in both the short run and the long run.   [½]
                                                                             [Maximum 4]

Solution X3.30

An increase in the money supply will cause a decrease in interest rates.   [½]

A decrease in interest rates will cause an increase in borrowing and a decrease in savings …   [½]

… therefore consumption and investment will increase.   [½]

A decrease in interest rates will make saving in the domestic economy less attractive and hot money will flow out of the country …   [½]

… resulting in a decrease in the value of the currency.   [½]

The decrease in the value of the currency will make exports cheaper and imports dearer …   [½]

… and hence increase the demand for exports and reduce the demand for imports.   [½]

The increase in consumption, investment and net exports will increase aggregate demand …   [½]

… which will increase output and/or prices.   [½]

The increase in prices will be greater, the closer the economy is to full capacity.   [½]
                                                                             [Maximum 4]

Solution X3.31

Dynamic stochastic general equilibrium (DSGE) models are drawn from both the new classical school and the new Keynesian school and have the following elements:

- They assume that individuals and firms make rational choices …   [½]

    … and aim to maximise welfare.   [½]

- They typically assume monopolistic competition in both goods and labour markets … [½]

    … and allow for a variety of frictions in the markets, *eg* menu costs, sticky wages. [½]

- Choices are made in conditions of uncertainty, and as events occur, expectations and rational choices change.   [½]

    This is why the models are *dynamic.*   [½]

- They allow the economy to be hit by frequent random (*stochastic*) shocks, …   [½]

    … which cause the economy to deviate from a predicable growth path, …   [½]

    … and affect the economy's future growth path.   [½]

- They analyse the macroeconomic situation through the interaction of many micro markets, …   [½]

    … by using a 'bottom-up' approach that builds up a *general equilibrium* from the interaction of equilibrium positions in many micro markets.   [½]

                                                                        [Maximum 4]

Solution X3.32

Reduction in income tax

Firms may be able to reduce costs by paying lower wages, ...   [½]

... as employees will incur less tax, which offsets their lower wages.   [½]

Tax cuts may encourage people to work more in exchange for less leisure time (*ie* the substitution effect of the tax cut) ...   [½]

... as the opportunity cost of leisure increases.   [½]

Furthermore, the tax cut might encourage more people into the workforce.   [½]

The labour supply then increases and firms may find it easier to hire the staff they need. [½]

However, the labour supply may decrease if people decide that they now need to work fewer hours to earn the same take-home pay.   [½]

It is possible that people may work more enthusiastically, which will increase firms' productivity.

                                                                                    [½]

Higher disposable incomes may lead to higher spending and hence higher demand for firms'
goods and services.   [½]

[Maximum 3 for income tax]

Reduction in corporation tax

A reduction in corporation tax will increase after-tax profits.   [½]

As a result, firms will have more profit to invest in their business.   [½]

The higher after-tax return from an investment will increase the incentive for firms to invest.   [½]

The possibility of higher profits will make it easier for firms to attract new investors.   [½]

[Maximum 4]

Solution X3.33

The new classical approach

Demand-side (monetary) policy is effective at controlling inflation, ...   [½]

... however it should not be used to increase growth and reduce unemployment.   [½]

Supply-side policy should be used to increase output and reduce unemployment.   [½]

New classical economists favour market-orientated supply-side policies.   [½]

The Keynesian approach

Demand-side policies should be used to increase aggregate demand in a recession, so as to
increase actual output and to reduce (demand-deficient) unemployment.   [½]

Supply-side policy should be used to increase potential output and to reduce equilibrium
unemployment over the long term.   [½]

Modern Keynesians favour interventionist supply-side policies.   [½]

[Maximum 3]

Solution X3.34
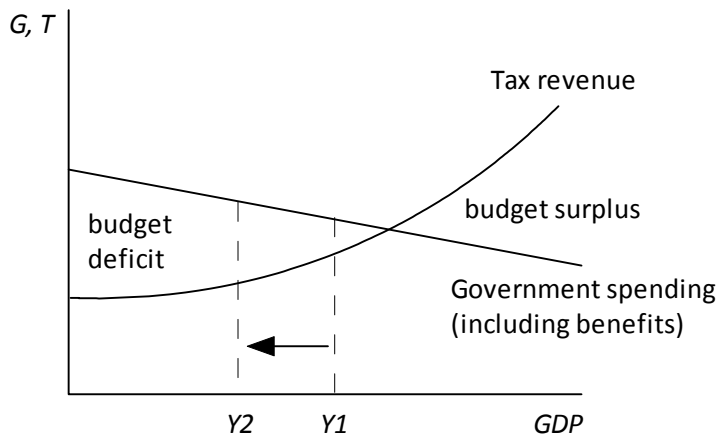
(i)   *Budget deficit*

The budget deficit is the excess of an organisation's spending over its revenues.   [½]

When applied to the government, it's the excess of its spending over its tax receipts.   [½]

(ii)   **How a recession increases the size of the budget deficit**

If the economy is in a recession, the budget deficit will increase because:

1.   tax revenues will be lower from:

        •   taxes on incomes, *eg* income tax, corporation tax, as incomes and profits will
                generally be lower   [½]

        •   taxes on goods and services, *eg* VAT, as spending will be lower   [½]

2.   government spending will be higher on:

        •   unemployment benefits, as unemployment will be higher   [½]

        •   social security benefits, as incomes will be lower.   [½]

[1 for diagram]

The diagram shows how a fall in national income due to a recession, *eg* from *Y1* to *Y2*, will lead to
an increase in the government's budget deficit, as government spending including benefits
increases at the same time as tax revenue falls.   [1]
                                                                                          [Total 4]

(iii)   **Structural deficit or surplus**

The *structural deficit (or surplus)* is the public sector deficit (or surplus) that would arise if the
economy was operating at the potential level of output, at which there is zero output gap.   [1]

Solution X3.35

(i)   **Definition of the real exchange rate index**

The *real exchange rate index (RERI)* is calculated by adjusting the nominal exchange rate index
(NERI) for changes in the relative prices of exports and imports.   [1]

Alternatively, the formula could be stated:

$$RERI = NERI \times \frac{P_X}{P_M}$$ *[1]*

(ii)   *The change in the real exchange rate index*

Using the formula, the new value of the *RERI* can be found as:

$$RERI = NERI \times \frac{P_X}{P_M} = 90 \times \frac{120}{80} = 135 \qquad \text{[½]}$$

Therefore the real exchange rate index has increased by 35%.   [½]

Solution X3.36

The *international trade multiplier* refers to the effect on the national income of Country Y of a change in exports (or imports) of Country X.   [1]

For example, suppose the USA adopts an expansionary fiscal policy in order to increase domestic national income and employment. The resultant increase in the demand for imports will increase the exports from other countries that trade with the USA, thereby increasing national income and employment in those countries.   [1]

The key influence on the value of the international multiplier is the openness of a country's economy to international trade.   [½]

More specifically it will be highest for those countries for whom exports represent a high percentage of national income.   [½]
[Total 3]

Solution X3.37

(i)   *Effect on interest rates and national income using the IS-MP model*

An increase in the demand for exports
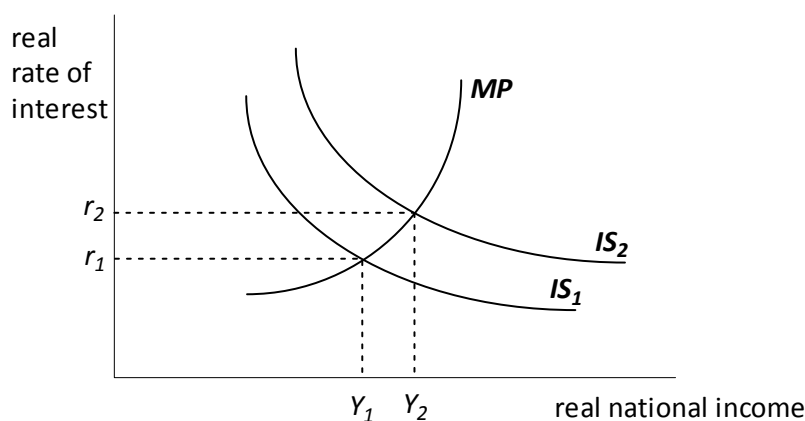
[1 for diagram]

An increase in exports raises aggregate demand and real income and shifts the *IS* curve to the right (from IS_1 to IS_2).   [½]

The increase in income leads to an increase in the inflation rate, so the central bank raises interest rates (*ie* there is a movement along the *MP* curve) ...   [½]

... to curb inflationary pressures and meet the inflation target.   [½]

So, as a consequence of the increase in exports, there is an increase in national income from Y_1 to Y_2 and an increase in interest rates from r_1 to r_2.   [½]
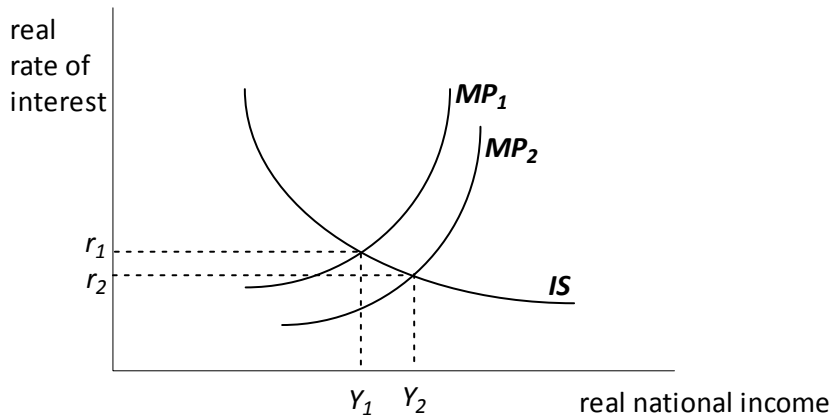
A loosening of monetary policy

[1 for diagram]

A looser monetary policy means that the central bank sets a lower interest rate for any given level of national income and rate of inflation, so the *MP* curve shifts to the right (from MP_1 to MP_2) and interest rates fall.   [½]

In response to the lower interest rates, there is a greater incentive to borrow, so consumption and investment increase.   [½]

Therefore aggregate demand and national income increase in response to the fall in interest rates (*ie* there is a movement along the *IS* curve).   [½]

So, as a consequence of the loosening of monetary policy, there is a decrease in interest rates from r_1 to r_2 and an increase in national income from Y_1 to Y_2.   [½]

[Maximum 5]

(ii)   ***Effect on national income of an increase in the money supply using the extended IS-LM model***
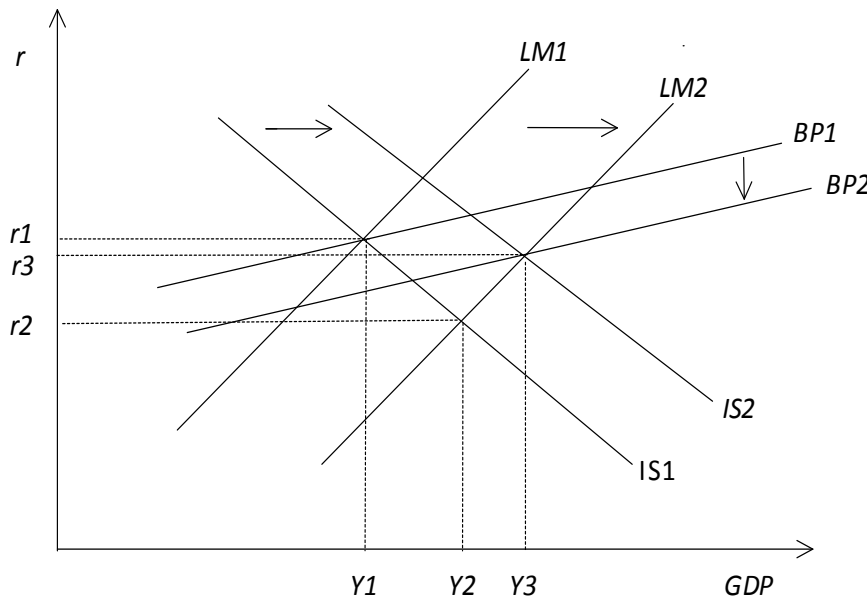
[2 for correct diagram]

An increase in the money supply will lead to an excess supply of money and hence a fall in the interest rate. The *LM* curve will therefore shift downwards, *ie* from *LM1* to *LM2*.   [½]

The direct effect of the fall in interest rates on the *domestic* economy will be an increase in consumption and investment, leading to an increase GDP from *Y1* to *Y2*.   [½]

*NB Remember that any change in the goods market due to a **change in the interest rate** results in a **movement along the IS curve**.*

However, in an *open economy*, the reduction in interest rates (from the original value of *r1* to *r2*) will also lead to a depreciation of the currency …   [½]

… which results in:

• the *BP* curve shifting downwards   [½]

• net exports increasing, which further increases aggregate demand, thereby shifting the *IS* curve to the right.   [1]

In other words, the effect of monetary policy on GDP is *reinforced* by the fall in the exchange rate, which further increases GDP from *Y2* to *Y3*.   [½]

[Maximum 5]

Solution X3.38

Markers: This question draws on many aspects of the course, hence the large number of potential marks.

Note that the government has two main objectives, regarding economic growth (ie the growth of real national output):

1. *to ensure that actual output is equal to potential output*

2. *to increase the potential output of the economy.*

Policies to ensure that actual output is equal to potential output [½]

Governments may use demand-management policies to try to ensure that aggregate demand is sufficient to keep all firms operating at normal capacity utilisation at all times. [½]

This *fine-tuning* policy aims to smooth out the economic cycle and prevent booms and slumps. [½]

The stability offered by such a policy gives businesses confidence to invest, and therefore contributes to an increase in potential output too. [½]

Some economists argue that such policies may not always work; and if they don't, they can be destabilising rather than stabilising. [½]

Others argue that businesses thrive when they are left alone to cope with the market economy, and that government intervention weakens market forces and encourages inefficiency. [½]

[Maximum 2]

Policies to increase potential output [½]

Growth in potential output derives from increases and/or improvements in the quantity and quality of the factors of production and in the efficiency with which they are used. [½]

Governments may introduce *interventionist policies* (*ie* those that replace or regulate the market) or *market-orientated policies* (*ie* those that remove or reduce restrictions on the free working of markets). [½]

[Maximum 1]

1. *Capital*

The government could increase its own investment, *eg* in new roads or hospitals. [½]

This might *pump prime* the economy, *ie* encourage businesses to invest in new capital equipment. [½]

Alternatively, it could seek to encourage private sector investment by ensuring that economic conditions are conducive to new investment by firms. [½]

Firms will invest if they expect high levels of demand for their products and high levels of profit.

[½]

Business confidence can usually be increased by a record of stable growth and sensible macroeconomic policies.   [½]

A policy of low real interest rates will encourage investment since, at a lower cost of capital, a greater number of potential new projects will appear to be profitable.   [½]

Tax relief and subsidies for investment expenditure could also be used to encourage investment by firms.   [½]

Over the long term, savings will need to increase to finance this increase in investment, so governments might wish to encourage savings by, for example, offering tax-free savings schemes.
                                                                                      [½]

Reductions in the taxation of profit will enable firms to plough back more profit into investment and encourage further investment.   [½]

Policies that reduce the power of labour and increase the flexibility of labour markets, such as short-term contracts and restrictions on the powers of trade unions, ...   [½]

... could also increase profitability and business confidence and hence increase investment.   [½]
                                                                              [Maximum 3]

Technological improvements will increase the marginal productivity of *capital*.   [½]

Much new investment will incorporate technological advances and therefore increase both the quantity and the quality of the capital stock.   [½]

In order to encourage research and development (R&D), the government could:

- provide R&D itself through its research institutions or via funding to universities and other research councils   [½]

- offer tax breaks and subsidies to private firms to carry out R&D   [½]

- strengthen the patent system so that firms will benefit more from R&D   [½]

- encourage the diffusion of R&D by providing information or subsidies to adopt new technology.   [½]
                                                                              [Maximum 1]

2.   *Labour*

The quantity of labour in an economy can be increased via increases in:

- the *population* – *eg* by offering incentives to have children or by attractive relocation packages for immigrants   [½]

- the proportion of the population that is employed, *eg* by improvements to child-care facilities or by increasing the retirement age   [½]

- working hours, *eg* by reducing income tax rates or making a pension conditional on working a 40-hour week.   [½]
                                                                              [Maximum 1]

In addition, investment in *human capital* increases the effectiveness of the physical stock of capital, and contributes to technological progress and spillover effects as ideas are spread and developed. [½]

Government investment in education, training and better health services can improve the quality of the labour force. [½]

The government could also encourage private industry to undertake more training. For example, it could provide subsidies for training or it could work in partnership with industry and unions to provide industry-wide training programmes. [½]

[Maximum 1]

3.   *Land and raw materials*

The overall quantity of land available is usually fixed, though there has been some reclamation of land from the sea, *eg* in Holland. [½]

In order to increase the supply of raw materials, the government could offer subsidies and/or tax breaks to encourage the exploration for, and mining of, natural resources. [½]

The quality of *land* can be improved, by, for example, using fertilisers to increase the yield from agricultural land and/or by constructing taller buildings. [½]

[Maximum 1]

4.   *Efficiency*

Efficiency could be further improved by:

- promoting freer world trade and reducing protectionism [½]

- restricting anti-competitive practices and encouraging competition [½]

- encouraging economic activity, by, for example, lower marginal tax rates. [½]

[Maximum 1]

[Maximum 10]