KASNEB

ADVANCED LEVEL

ADVANCED PORTFOLIO MANAGEMENT

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STUDY PACK

PAPER NO. 15

INTRODUCTION

Following our continued effort to provide quality study and revision materials at an affordable price for the private students who study on their own, full time and part time students, we partnered with other team of professionals to make this possible.

This Study Text covers KASNEB syllabus and contains past examination past papers and our suggested answers as examples which are provided by a team of lecturers who are experts in their area of training. The book is intended to help the learner do enough study and practice on how to handle exam questions and this makes it easy to pass kasneb exams.

Special appreciation and recognition goes to FA Kegicha William Momanyi (MBA Accounting, CPA, CISA and CCP), Johnmark Mwangi (MSc Finance, CPAK, BCom Finance), and FA Bramwel Omogo (B.sc Acturial Science, CIFA, CIIA final level and ICIFA member)

UNIT DESCRIPTION

This paper is intended to equip the candidate with the knowledge, skills and attitudes that will enable him/her to apply advanced financial techniques and methods in portfolio management.

LEARNING OUTCOMES

A candidate who passes this paper should be able to:

- Develop investment policy statement for individual and institutional investors
- Construct a portfolio using different asset classes
- Analyse different strategies used to manage a portfolio of different asset classes
- Apply trade execution decisions and techniques in portfolio management
- Undertake portfolio monitoring and rebalancing processes
- Evaluate the performance of a portfolio.

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CHAPTER ONE

CAPITAL MARKETS FORECASTS

Capital market expectations are key components of the portfolio management process. When combined with the client's objectives and constraints from the investment policy statement, they lead to the strategic asset allocation. Essentially, capital market expectations consist of expected return, correlation, and standard deviation for each asset class. This Topic Review covers a variety of techniques that may be used to form capital market expectations.

FORMULATING CAPITAL MARKET EXPECTATIONS

Capital market expectations can be referred to as macro expectations (expectations regarding classes of assets) or micro expectations (expectations regarding individual assets). Micro expectations are most directly used in individual security selection.

In other assignments, macro expectations are referred to as top-down while micro expectations are referred to as bottom-up.

Using a disciplined approach leads to more effective asset allocations and risk management. Formulating capital market expectations is referred to as beta research because it is related to systematic risk. It can be used in the valuation of both equities and fixed-income securities. Alpha research, on the other hand, is concerned with earning excess returns through the use of specific strategies within specific asset groups.

To formulate capital market expectations, the analyst should use the following 7-step process.

Step 1: Determine the specific capital market expectations needed according to the investor's tax status, allowable asset classes, and time horizon. Time horizon is particularly important in determining the set of capital market expectations that are needed.

Step 2: Investigate assets' historical performance to determine the drivers that have affected past performance and to establish some range for plausible future performance. With the drivers of past

performance established, the analyst can use these to forecast expected future performance as well as compare the forecast to past results to see if the forecast appears reasonable.

Step 3: Identify the valuation model used and its requirements. For example, a comparables-based, relative value approach used in the United States may be difficult to apply in an emerging market analysis.

Step 4: Collect the best data possible. The use of faulty data will lead to faulty conclusions. The following issues should be considered when evaluating data for possible use:

- Calculation methodologies.
- Data collection techniques.
- Data definitions.
- Error rates.
- Investability and correction for free float.
- Turnover in index components.
- Potential biases.

Step 5: Use experience and judgment to interpret current investment conditions and decide what values to assign to the required inputs. Verify that the inputs used for the various asset classes are consistent across classes.

Step 6: Formulate capital market expectations. Any assumptions and rationales used in the analysis should be recorded. Determine that what was specified in Step 1 has been provided.

Step 7: Monitor performance and use it to refine the process. If actual performance varies significantly from forecasts, the process and model should be refined.

PROBLEMS IN FORECASTING

Discuss, in relation to capital market expectations, the limitations of economic data, data measurement errors and biases, the limitations of historical estimates, ex post risk as a biased measure of ex ante risk, biases in analysts' methods, the failure to account for conditioning information, the misinterpretation of correlations, psychological traps, and model uncertainty.

As mentioned earlier, poor forecasts can result in inappropriate asset allocations. The analyst should be aware of the potential problems in data, models, and the resulting capital market expectations. Nine problems encountered in producing forecasts are

(1) limitations to using economic data

(2) data measurement error and bias

(3) limitations of historical estimates,

(4) the use of ex post risk and return measures,

(5) non-repeating data patterns,

(6) failing to account for conditioning information,

(7) misinterpretation of correlations

(8) psychological traps

(9) model and input uncertainty.

1. There are several limitations to using economic data. First, the time lag between collection and distribution is often quite long. The International Monetary Fund, for example, reports data with a lag of as much as two years. Second, data are often revised and the revisions are not made at the same time as the publication.

Third, data definitions and methodology change over time. For example, the basket of goods in the Consumer Price Index changes over time. Last, data indices are often rebased over time (i.e., the base upon which they are calculated is changed).

Although a rebasing is not a substantial change in the data itself, the unaware analyst could calculate changes in the value of the indices incorrectly if she does not make an appropriate adjustment.

2. The formation of capital market expectations can also be adversely affected by several forms of data measurement errors and biases. The first problem is transcription errors, which are simply recording information incorrectly and are more serious if they are biased in a certain direction. A second problem arises from survivorship bias. As an example, a return series based on a stock index will be biased upwards if the return calculation does not include firms that have been dropped from the index due to delistings. Third, the use of appraisal (smoothed) data, instead of actual returns, results in correlations and standard deviations that are biased downwards. The reason is that actual price fluctuations are masked by the use of appraised data. One potential solution is to rescale the data so that the mean return is unaffected, but the variance is increased based on the underlying economic fundamentals.

3. The limitations of historical estimates can also hamper the formation of capital market expectations. The values from historical data must often be adjusted going forward as economic, political, regulatory, and technological environments change. This is particularly true for volatile assets such as equity. These changes are known as regime changes and result in nonstationary data. For example, the bursting of the technology bubble in 2000 resulted in returns data that were markedly different than that from the previous five years. Nonstationarity would mean different periods in the time series have different statistical properties and create problems with standard statistical testing methods.

Historical data is the starting point for estimating the following capital market expectations: expected return, standard deviation, and correlations. However, it is not obvious how to select the time period of historical data. A long time period is preferable for several reasons.

- It may be statistically required. To calculate historical covariance (and correlation), the number of data points must exceed the number of covariances to be calculated.
- A larger data set (time period) provides more precise statistical estimates with smaller variance to the estimates.
- As a related issue, if the time period is longer for a larger data set, the calculated statistics are generally less sensitive to the starting and ending points selected for the time period.

However, long time periods also create potential problems.

1. A longer time period is more likely to include regime changes, which are shifts in underlying fundamentals. Each regime change creates a subperiod with distinctly different characteristics. For example, the behavior of real estate and virtually every financial asset was different before and after the Financial Market Meltdown of 2008.

a) This creates nonstationarity, which invalidates many statistics calculated from time periods starting before and ending after the meltdown.

b) It forces the analyst to use judgment to decide whether the subperiod before or after the meltdown will be more relevant going forward.

2. It may mean the relevant time period is too short to be statistically significant.

3. It creates a temptation to use more frequent data, such as weekly data, rather than monthly data points in order to have a larger sample size. Unfortunately, more frequent data points are often more likely to have missing or outdated values (this is called asynchronism) and can result in lower, distorted correlation calculations.

4. Using ex post data (after the fact) to determine ex ante (before the fact) risk and return can be problematic. For example, suppose that several years ago investors were fearful that the Federal Reserve was going to have to raise interest rates to combat inflation. This situation would cause depressed stock prices. If inflation abated without the Fed's intervention, then stock returns would increase once the inflation scenario passes. Looking back on this situation, the researcher would conclude that stock returns were high while being blind to the prior risk that investors had faced. The analyst would then conclude that future (ex ante) returns for stocks will be high. In sum, the analyst would underestimate the risks that equity investors face and overestimate their potential returns.

5. Using historical data, analysts can also uncover patterns in security returns that are unlikely to occur in the future and can produce biases in the data. One such bias is data mining. Just by random chance, some variables will appear to have a relationship with security returns, when, in fact, these relationships are unlikely to persist. For example, if the analyst uses a 5% significance level and examines the relationship between stock returns and 40 randomly selected variables, two (5%) of the variables are expected to show a statistically significant relationship with stock returns just by random chance. Another potential bias results from the time span of data chosen (time period bias) . For example, small-cap U.S. stocks are widely thought to outperform large-cap stocks, but their advantage disappears when data from the 1970s and 1980s is excluded.

To avoid these biases, the analyst should first ask himself if there is any economic basis for the variables found to be related to stock returns. Second, he should scrutinize the modeling process for susceptibility to bias. Third, the analyst should test the discovered relationship with out-of-sample data to determine if the relationship is persistent. This would be done by estimating the relationship with one portion of the historical data and then reexamining it with another portion.

6. Analysts' forecasts may also fail to account for conditioning information. The relationship between security returns and economic variables is not constant over time. Historical data reflects performance over many different business cycles and economic conditions. Thus, analysts should account for current conditions in their forecasts. As an example, suppose a firm's beta is estimated at 1 .2 using historical data. If, however, the original data are separated into two ranges by economic expansion or recession, the beta might be 1.0 in expansions and 1 .4 in recessions. Going forward, the analyst's estimate of the firm's beta should reflect whether an expansion is expected (i.e., the expected beta is 1 .0) or a recession is expected (i.e., the expected beta is 1 .4). The beta used should be the beta consistent with the analyst's expectations for economic conditions.

7. Another problem in forming capital market expectations is the misinterpretation of correlations (i.e., causality). Suppose the analyst finds that corn prices were correlated with rainfall in the Midwestern United States during the previous quarter.

It would be reasonable to conclude that rainfall influences corn prices. It would not be reasonable to conclude that corn prices influence rainfall, although the correlation statistic would not tell us that. Rainfall is an exogenous variable (i.e., it arises outside the model), whereas the price of corn is an endogenous variable (i.e., it arises within the model).

It is also possible that a third variable influences both variables. Or it is possible that there is a nonlinear relationship between the two variables that is missed by the correlation statistic, which measures linear relationships.

These scenarios illustrate the problem with the simple correlation statistic. An alternative to correlation for uncovering predictive relationships is a multiple regression. In a multiple regression, lagged terms, control variables, and nonlinear terms can all be included as independent variables to better specify the relationship. Controlling for other effects, the regression coefficient on the variable of interest is referred to as the partial correlation and would be used for the desired analysis.

8. Analysts are also susceptible to psychological traps. We discuss six possible traps

in the following:

- The anchoring trap
- The status quo trap
- The confirming evidence trap
- The overconfidence trap
- The prudence trap
- The recallability trap

If an analyst is susceptible to the **anchoring trap**, he puts too much weight on the first set of information received. For example, if during a debate on the future of the economy, the first economist to speak states that there will be a recession while the second economist states that there will be an expansion, the analyst may use the recession scenario as an anchor and put less credence on the expansion scenario.

In the **status quo trap**, the analyst's predictions are highly influenced by the recent past. If inflation is currently 4%, for example, it is easier for the analyst to forecast a value close to 4% rather than risk a forecast that differs much from past values.