KASNEB

CIFA PART III SECTION 5

ALTERNATIVE INVESTMENTS ANALYSIS

THURSDAY: 26 November 2015. Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

(a) Highlight six types of risks associated with infrastructure as a form of alternative investment. (6 marks)

(b) Describe three investment characteristics of stripped mortgage-backed securities. (3 marks)

(c) The ultimate goal for private equity investment is to improve new or under-performing businesses and exit them at high valuations. However, the time to exit can range from less than six months to over 10 years.

Required:
In relation to the above statement, examine three exit strategies pursued by private equity portfolio managers. (3 marks)

(d) Kipkorir Kipyegon is an alternative investment manager for Stanbib Asset Managers (SAM) which deals with commodities trading. He is currently investigating trading opportunities in the copper market. The spot price is Sh.316 and the three-month forward contract price is Sh.313. He is contemplating implementing a reverse cash and carry arbitrage to profit from the difference between the spot and forward prices.

Currently, Kipyegon can borrow or lend cash at the rate of 5% and the lease rate for copper is 6%. The borrowing, lending and lease rates are all continuously compounded interest rates.

Required:
(i) Describe the two components of the synthetic commodity position in this arbitrage. (2 marks)

(ii) Compute Kipyegon's profit on a reverse cash and carry arbitrage in the copper market. (6 marks)
(Total: 20 marks)

QUESTION TWO

(a) Explain the following economic terms as used in private equity fund structures:

(i) Carried interest. (1 mark)

(ii) Ratchet. (1 mark)

(iii) Hurdle rate. (1 mark)

(iv) Management fees. (1 mark)

(v) Vintage year. (1 mark)

(b) Assess five ways which drives expansion of real estate investment trusts (REITs). (5 marks)

(c) An investor purchases a 30-year, Sh.500,000 level payment fully amortised mortgage with a fixed rate of 12%.

Required:
The outstanding principal at the end of three months. (3 marks)

(d) The original founder members of Madonge Ltd. are extremely optimistic and believe that the firm could be sold for Sh.400 million in six years. To achieve this target, they speculate that the firm will require another capital infusion of Sh.40 million in four years time in addition to the Sh.20 million capital investment today.

Given the high risk of the firm, Madonge Ltd.'s private equity investors decide that a discount rate of 40% for the first four years and 30% for the last two years would be appropriate. The founders of Madonge Ltd. intend to hold five million shares.

Required:

(i) The firm's post money valuation at the first round of financing using the net present value (NPV) venture capital method. (4 marks)

(ii) The appropriate share price after the first round of financing for Madonge Ltd.'s first round investors. (3 marks)

(Total: 20 marks)

QUESTION THREE

(a) Kiraita Kindika is the chief investment officer of a pension fund which allocates a substantial portion of its assets to private equity. The existing private equity portfolio is made up of large buyout funds, mezzanine funds and a limited allocation to a special situations fund. The pension fund decided to further increase its allocation to a venture capital.

Required:

In relation to the above statement, summarise four differences between venture capital and buyout investing. (4 marks)

(b) (i) Summarise four classifications of hedge funds. (4 marks)

(ii) Explain three regulatory concerns associated with hedge funds. (3 marks)

(c) An investment analyst gathered the following data relating to three collateralised mortgage obligation (CMO) tranches:

| | | Spread comparison | |
	Nominal spread (%)	Zero volatility spread (%)	Option adjusted spread (%)
Security X	2.12	1.67	0.00
Security Y	3.18	1.30	-0.27
Security Z	1.84	1.46	0.67

Required:

Determine the most appropriate security for the investment analyst to invest in. (3 marks)

(d) A collateralised debt obligation (CDO) is a Sh.200 million structure. The collateral is expected to have an initial value of Sh.200 million. The collateral also consists entirely of bonds with 15 years to maturity and a coupon rate equal to 15-year treasury bond rate plus 350 basis points.

The senior tranche represents 75% of the structure and carries a floating coupon rate equal to LIBOR plus 150 basis points. There is only one Sh.20 million mezzanine tranche which carries a fixed coupon equal to the treasury rate at origination plus 175 basis points. The manager of the Trust has entered into an interest rate swap under which the Trust will pay an annual fixed rate equal to the treasury rate plus 125 basis points and receive LIBOR. The notional amount for this swap is Sh.150 million. The 15-year treasury rate is 7.5% at the time of origination for this CDO.

Required:

Calculate the cash flow available to pay the tranche. (6 marks)

(Total: 20 marks)

QUESTION FOUR

(a) Evaluate four ways in which investors could participate in commodity markets. (4 marks)

(b) Discuss four challenges that could be encountered by investment professionals when analysing private equity investments. (4 marks)

(c) A critical investment feature that distinguishes commercial mortgage-backed securities (CMBS) from residential mortgage-backed securities (RMBS) is the protection against early prepayments available to investors called "call protection". An investor in RMBS is exposed to considerable prepayment risk since the borrower has the right to repay a loan, in whole or in part, before the scheduled principal repayment date.

Required:

With reference to the above statement, explain four mechanisms that offer investors call protection at the loan level. (4 marks)

(d)   The general partner for a private equity fund charges a management fee of 2% and carried interest of 20% using the total return method. The total committed capital for the fund is Sh.150 million.

The following data relates to the above equity fund:

Year	Capital called down Sh. "million"	Cash flows Operating results Sh. "million"	Distributions Sh. "million"
2010	50	-10	-
2011	20	-25	-
2012	30	25	-
2013	20	50	20
2014	10	60	40
2015	10	110	80

Required:
Residual value to paid in (RVPI).

(8 marks)

(Total: 20 marks)

QUESTION FIVE

(a)   Evaluate three key benefits of using price-to-funds from operations (P/FFO) and price-to-adjusted funds from operations (P/AFFO) multiples in the valuation of real estate investment trusts (REITs) and real estate operating companies (REOCs).

(3 marks)

(b)   Discuss three sources of return for a commodity futures position.

(3 marks)

(c)   Distinguish between the following terms:

(i)   "Contango" and "backwardation".

(2 marks)

(ii)   "Market-defensive funds of funds" and "strategic funds of funds".

(2 marks)

(d)   Brian Nyanam has recently completed a monte carlo simulation analysis of a collateralised mortgage obligation (CMO) tranche. His analysis includes six equally weighted paths, with the present value of each calculated using four different discount rates.

The table below illustrates this information:

Representative path	At 50 basis points spread	Present values: At 60 basis points spread	At 70 basis points spread
1	70	68	68
2	73	70	68
3	68	66	64
4	71	69	68
5	77	75	73
6	75	73	71

The actual market price of the CMO tranche being valued is 70.17.

Required:
Determine the tranche's option adjusted spread (OAS).

(3 marks)

(e)   (i)   Define the term "rolling return of a hedge fund".

(1 mark)

(ii) The following information relates to a hedge fund's returns and the respective index returns for twelve months:

Month	Hedge fund returns (%)	Index returns (%)
January	3.50	-2.40
February	4.00	-4.00
March	-2.00	-1.60
April	-2.00	3.00
May	-1.00	-4.20
June	0.90	2.00
July	-1.00	2.50
August	1.70	-2.10
September	2.70	-2.00
October	3.70	0.50
November	0.40	3.10
December	-3.20	0.20

Required:
The average rolling return for the hedge fund if the investor's investment horizon is nine months. (6 marks)

(Total: 20 marks)

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Present Value of 1 Received at the End of n Periods:

$$PVIF_{r,n} = 1/(1+r)^n = (1+r)^{-n}$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%	36%
1	.9901	.9804	.9709	.9615	.9524	.9434	.9346	.9259	.9174	.9091	.8929	.8772	.8696	.8621	.8475	.8333	.8065	.7813	.7576	.7353
2	.9803	.9612	.9426	.9246	.9070	.8900	.8734	.8573	.8417	.8264	.7972	.7695	.7561	.7432	.7182	.6944	.6504	.6104	.5739	.5407
3	.9706	.9423	.9151	.8890	.8638	.8396	.8163	.7938	.7722	.7513	.7118	.6750	.6575	.6407	.6086	.5787	.5245	.4768	.4348	.3975
4	.9610	.9238	.8885	.8548	.8227	.7921	.7629	.7350	.7084	.6830	.6355	.5921	.5718	.5523	.5158	.4823	.4230	.3725	.3294	.2923
5	.9515	.9057	.8626	.8219	.7835	.7473	.7130	.6806	.6499	.6209	.5674	.5194	.4972	.4761	.4371	.4019	.3411	.2910	.2495	.2149
6	.9420	.8880	.8375	.7903	.7462	.7050	.6663	.6302	.5963	.5645	.5066	.4556	.4323	.4104	.3704	.3349	.2751	.2274	.1890	.1580
7	.9327	.8706	.8131	.7599	.7107	.6651	.6227	.5835	.5470	.5132	.4523	.3996	.3759	.3538	.3139	.2791	.2218	.1776	.1432	.1162
8	.9235	.8535	.7894	.7307	.6768	.6274	.5820	.5403	.5019	.4665	.4039	.3506	.3269	.3050	.2660	.2326	.1789	.1388	.1085	.0854
9	.9143	.8368	.7664	.7026	.6446	.5919	.5439	.5002	.4604	.4241	.3606	.3075	.2843	.2630	.2255	.1938	.1443	.1084	.0822	.0628
10	.9053	.8203	.7441	.6756	.6139	.5584	.5083	.4632	.4224	.3855	.3220	.2697	.2472	.2267	.1911	.1615	.1164	.0847	.0623	.0462
11	.8963	.8043	.7224	.6496	.5847	.5268	.4751	.4289	.3875	.3505	.2875	.2366	.2149	.1954	.1619	.1346	.0938	.0662	.0472	.0340
12	.8874	.7885	.7014	.6246	.5568	.4970	.4440	.3971	.3555	.3186	.2567	.2076	.1869	.1685	.1372	.1122	.0757	.0517	.0357	.0250
13	.8787	.7730	.6810	.6006	.5303	.4688	.4150	.3677	.3262	.2897	.2292	.1821	.1625	.1452	.1163	.0935	.0610	.0404	.0271	.0184
14	.8700	.7579	.6611	.5775	.5051	.4423	.3878	.3405	.2992	.2633	.2046	.1597	.1413	.1252	.0985	.0779	.0492	.0316	.0205	.0135
15	.8613	.7430	.6419	.5553	.4810	.4173	.3624	.3152	.2745	.2394	.1827	.1401	.1229	.1079	.0835	.0649	.0397	.0247	.0155	.0099
16	.8528	.7284	.6232	.5339	.4581	.3936	.3387	.2919	.2519	.2176	.1631	.1229	.1069	.0930	.0708	.0541	.0320	.0193	.0118	.0073
17	.8444	.7142	.6050	.5134	.4363	.3714	.3166	.2703	.2311	.1978	.1456	.1078	.0929	.0802	.0600	.0451	.0258	.0150	.0089	.0054
18	.8360	.7002	.5874	.4936	.4155	.3503	.2959	.2502	.2120	.1799	.1300	.0946	.0808	.0691	.0508	.0376	.0208	.0118	.0068	.0039
19	.8277	.6864	.5703	.4746	.3957	.3305	.2765	.2317	.1945	.1635	.1161	.0829	.0703	.0596	.0431	.0313	.0168	.0092	.0051	.0029
20	.8195	.6730	.5537	.4564	.3769	.3118	.2584	.2145	.1784	.1486	.1037	.0728	.0611	.0514	.0365	.0261	.0135	.0072	.0039	.0021
25	.7798	.6095	.4776	.3751	.2953	.2330	.1842	.1460	.1160	.0923	.0588	.0378	.0304	.0245	.0160	.0105	.0046	.0021	.0010	.0005
30	.7419	.5521	.4120	.3083	.2314	.1741	.1314	.0994	.0754	.0573	.0334	.0196	.0151	.0116	.0070	.0042	.0016	.0006	.0002	.0001
40	.6717	.4529	.3066	.2083	.1420	.0972	.0668	.0460	.0318	.0221	.0107	.0053	.0037	.0026	.0013	.0007	.0002	.0001		
50	.6080	.3715	.2281	.1407	.0872	.0543	.0339	.0213	.0134	.0085	.0035	.0014	.0009	.0006	.0003	.0001				
60	.5504	.3048	.1697	.0951	.0535	.0303	.0173	.0099	.0057	.0033	.0011	.0004	.0002	.0001						

* The factor is zero to four decimal places

Present Value of an Annuity of 1 Per Period for n Periods:

$$PVIF_{r,t} = \sum_{t=1}^{n} \frac{1}{(1+r)^t} = \frac{1 - \dfrac{1}{(1+r)^n}}{r}$$

Number of payments	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.8929	0.8772	0.8696	0.8621	0.8475	0.8333	0.8065	0.7813	0.7576
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.6901	1.6467	1.6257	1.6052	1.5656	1.5278	1.4568	1.3916	1.3315
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4018	2.3216	2.2832	2.2459	2.1743	2.1065	1.9813	1.8684	1.7663
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.0373	2.9137	2.8550	2.7982	2.6901	2.5887	2.4043	2.2410	2.0957
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6048	3.4331	3.3522	3.2743	3.1272	2.9906	2.7454	2.5320	2.3452
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.1114	3.8887	3.7845	3.6847	3.4976	3.3255	3.0205	2.7594	2.5342
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.5638	4.2883	4.1604	4.0386	3.8115	3.6046	3.2423	2.9370	2.6775
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	4.9676	4.6389	4.4873	4.3436	4.0776	3.8372	3.4212	3.0758	2.7860
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.3282	4.9464	4.7716	4.6065	4.3030	4.0310	3.5655	3.1842	2.8681
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.6502	5.2161	5.0188	4.8332	4.4941	4.1925	3.6819	3.2689	2.9304
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	5.9377	5.4527	5.2337	5.0286	4.6560	4.3271	3.7757	3.3351	2.9776
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.1944	5.6603	5.4206	5.1971	4.7932	4.4392	3.8514	3.3868	3.0133
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.4235	5.8424	5.5831	5.3423	4.9095	4.5327	3.9124	3.4272	3.0404
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.6282	6.0021	5.7245	5.4675	5.0081	4.6106	3.9616	3.4587	3.0609
15	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5595	8.0607	7.6061	6.8109	6.1422	5.8474	5.5755	5.0916	4.6755	4.0013	3.4834	3.0764
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237	6.9740	6.2651	5.9542	5.6685	5.1624	4.7296	4.0333	3.5026	3.0882
17	15.5623	14.2919	13.1661	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436	8.0216	7.1196	6.3729	6.0472	5.7487	5.2223	4.7746	4.0591	3.5177	3.0971
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556	8.2014	7.2497	6.4674	6.1280	5.8178	5.2732	4.8122	4.0799	3.5294	3.1039
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501	8.3649	7.3658	6.5504	6.1982	5.8775	5.3162	4.8435	4.0967	3.5386	3.1090
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1285	8.5136	7.4694	6.6231	6.2593	5.9288	5.3527	4.8696	4.1103	3.5458	3.1129
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226	9.0770	7.8431	6.8729	6.4641	6.0971	5.4669	4.9476	4.1474	3.5640	3.1220
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4269	8.0552	7.0027	6.5660	6.1772	5.5168	4.9789	4.1601	3.5693	3.1242
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574	9.7791	8.2438	7.1050	6.6418	6.2335	5.5482	4.9966	4.1659	3.5712	3.1250
50	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2335	10.9617	9.9148	8.3045	7.1327	6.6605	6.2463	5.5541	4.9995	4.1666	3.5714	3.1250
60	44.9550	34.7609	27.6756	22.6235	18.9293	16.1614	14.0392	12.3766	11.0480	9.9672	8.3240	7.1401	6.6651	6.2402	5.5553	4.9999	4.1667	3.5714	3.1250