

# KASNEB

## CIFA PART III SECTION 5

### ALTERNATIVE INVESTMENTS ANALYSIS

THURSDAY: 24 November 2016.

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) Describe the following classes of modern alternative investments:

- (i) Managed futures. (1 mark)
- (ii) Hedge funds. (1 mark)
- (iii) Distressed securities. (1 mark)

(b) Highlight three errors that an investment analyst could make when valuing real estate investments trusts (REITs) using the discounted cash flow method. (3 marks)

(c) An arbitrageur trades gold when the spot price is 400 United States Dollars (USD) per ounce (oz) while one-year futures contract price is USD 460/oz. An investor can borrow or lend funds at a rate of 10% per annum.

Assume that the transaction cost is 3%.

**Required:**

The arbitrage profit from this transaction. (6 marks)

(d) A single tenant office building was leased six years ago at a price of Sh.2,000,000 per year. The next rent review occurs in two years time. The estimated rental value (ERV) in two years based on the current market conditions is Sh.3,000,000 per year.

The all risk yield cap rate for comparable fully - let properties is 7%. Due to lower risk, the appropriate rate to discount the term rent is 6%.

**Required:**

The value of the office building. (5 marks)

(e) Ten equally weighted representative paths are used in the Monte Carlo simulation model. For the different spreads used, the present value of each representative path for a collateralised mortgage obligation (CMO) tranche is as shown below:

Representative path	Present value if spread is:		
	75 basis points (bps)	80 basis points (bps)	85 basis points (bps)
1	72	62	65
2	77	75	72
3	81	79	76
4	84	81	77
5	69	65	63
6	83	81	77
7	91	87	83
8	87	85	81
9	69	66	62
10	93	59	56

The market price of tranche Y is 74.

**Required:**

The option adjusted spread (OAS) of tranche Y. (3 marks)

(Total: 20 marks)

## QUESTION TWO

- (a) (i) Evaluate three contrasts between “venture capital” and “buyouts” as used in private equity investments. (3 marks)
- (ii) Venture capital firms have become increasingly specialised as a result of the intensive knowledge base required to invest in the technology, telecommunications, and biotechnology industries. Specialisation has expanded further to include the stage of investment in the life cycle of a start-up company. Unfortunately, specialisation has led to concentrated portfolios, the very anathema of reduced risk through diversification. This concentration has led to the need for higher risk premiums.

**Required:**

With reference to the above statement, assess three main risks that could contribute to the higher required risk premiums for venture capital. (3 marks)

- (b) Discuss three considerations that should be taken into account when forecasting long-term growth rates for real estate investment trusts (REITs) and real estate operating companies (REOCs) using the discounted cash flow approach. (3 marks)
- (c) Ali Musa is an alternative investments manager at Venus Capital. He is considering analysing a two-tranche (a PAC 1 tranche and a support tranche) from a collateralised mortgage obligation (CMO) that was issued 18 months ago. When the CMO was issued, the initial collar of the PAC 1 tranche was 150-400 PSA. He estimates the change in the average life of each tranche as the prepayment speed varies, assuming the prepayment speed stays at that speed until the tranche matures. The results are as shown below:

**Average life of tranches XX and tranche YY for varying prepayment speeds:**

PSA speeds	Average Life	
	Tranche XX	Tranche YY
0	21.9	12.2
50	17.5	8.9
100	13.2	5.1
150	9.1	5.1
200	4.3	5.1
250	3.6	5.1
300	2.9	5.1
350	2.0	4.7
400	1.4	3.9

**Note:**

- PSA is the public securities association, a model for analysing mortgage-backed securities.
- PAC is the planned amortisation class.

**Required:**

- (i) Determine the most likely support tranche. (2 marks)
- (ii) Determine the effective collar of PAC 1 tranche. (2 marks)
- (d) A real estate investment with an initial cost of Sh.45 million was sold after five years at a price of Sh.75 million. The cost associated with the sale was Sh.5 million, and the tax depreciation in each year was Sh.2 million. At the time of the sale, the outstanding mortgage balance will be Sh.34 million. The tax rate on recaptured depreciation and the long-term capital gain tax rate is 30%.

**Required:**

The equity reversion after tax for this real estate investment. (3 marks)

- (e) Stela Wambua is conducting due diligence on a hedge fund for a pension fund. She gathers the following information relating to the structure of the fund:
1. The fund employs three people – two principals; Samuel Mulati and John Omulundo, and an administrative assistant. Samuel Mulati’s prior work experience is 10 years as an equity analyst at Jeremy Investment Bank and prior to that as an associate at a law firm. He holds Bachelor of Business Administration (BBA) and Bachelor of Laws (LLB) degrees.
  2. John Omulundo worked for three years as an equity fund manager at a medium size mutual fund. Prior to that, he was a corporate finance associate at a start up investment bank.

3. The principals are employed on contract basis.
4. The fund's relationship with its prime broker extends back two years. The fund has used only one prime broker since it was formed. The prime broker is a prestigious firm ranked number two by rating agencies in the brokerage business.

**Hedge fund strategy:**

- The fund invests in both fixed income and equities markets.
- The fund buys 10-year Treasury note and borrows short-term loans abroad in markets that have particularly low interest rates to earn, currently, a positive spread.
- The fund conducts merger arbitrage involving the securities of the target and acquirer.

**Legal strategy:**

The fund has a 1 and 20 fee structure and a two-year lock-up period.

**Required:**

Based on the above information, analyse four risk factors associated with this hedge fund investment. (4 marks)

**(Total: 20 marks)**

**QUESTION THREE**

- (a) (i) Research and Development (R & D) and patents provide an important insight into intellectual property (IP) in the context of the establishment and preservation of property rights. Unlike tangible assets, for which property rights are typically indicated by possession and usually clearly established, IP often raises challenges regarding its potential non-excludability.

**Required:**

In the context of the above statement, summarise five risks associated with investment in patents as a category of intellectual property investment. (5 marks)

- (ii) Institutional investors have recently expressed an increased interest in the returns produced by direct ownership of real assets, and in particular farmland assets.

**Required:**

In relation to the above statement, discuss three factors that have motivated institutional investors to venture into farmland investment. (6 marks)

- (b) Highlight two assumptions of models used in the valuation of mortgage-backed securities. (2 marks)

- (c) Describe two conditions necessary to value a security using Monte Carlo simulation model. (2 marks)

- (d) A venture capital fund manager is considering investing Sh.25 million in a new project that he believes would pay Sh.120 million at the end of five years. The cost of equity for the investor is 15%. The estimated probability of failure is presented below:

Year	1	2	3	4	5
Probability of failure	0.20	0.20	0.17	0.15	0.15

**Note:** The above probabilities are conditional probabilities since they represent the probability of failure in year N, given that the firm has survived to year N.

**Required:**

- (i) The net present value (NPV) of the potential investment. (4 marks)

- (ii) Comment on the decision you would make based on the results obtained in (d)(i) above. (1 mark)

**(Total: 20 marks)**

**QUESTION FOUR**

- (a) With respect to commodities markets, describe the following indices:

- (i) Value-based index. (1 mark)

- (ii) Quantity-based index. (1 mark)

- (iii) Total return index. (1 mark)

- (iv) Excess return index. (1 mark)

**CF53 Page 3  
Out of 5**

- (b) (i) Discuss three functions of a private equity fund manager. (3 marks)
- (ii) Describe three differences between private equity fund and quoted equity fund. (3 marks)

(c) Furaha Property Investment Limited is intending to purchase a complex of 20 specialty retail shops. At this time, 18 units are occupied under graduated leases with five years currently remaining, and two units are vacant. Each of the units measures approximately 2,000 square feet. Under the existing leases, current rents (for year 2016) are in line with market rates at Sh.12 per square foot a year, and all lease agreements are reviewed at the beginning of each year. An analyst, Fatuma Juma who works for Furaha Property Investment Limited has assembled the following facts to assist her in valuation of the property which is offered at Sh.4,500,000:

1. Under the graduated lease provision, rents will increase at a rate of 5% per year in line with expectations for the commercial rental market.
2. Vacancy rates of 10% are considered typical in this sector.
3. The current tax rate is Sh.18.50 per Sh.1,000 of assessed valuation. The property is assessed for tax purposes at Sh.4 million. Neither the tax rate nor assessed value is expected to change in the next one year.
4. The landlord is responsible for all real estate taxes, exterior maintenance, comprehensive insurance, management expenses and repairs or replacements.
5. The following cost elements are expected to increase at a rate of 3% per year for the foreseeable future:

**2016 Cost Elements**

- Maintenance: General maintenance costs are Sh.500 per month.
- Insurance: Annual premium for comprehensive insurance is Sh.10,000.
- Management: Annual management expenses are Sh.25,000.
- Repairs: Allowance for repairs and replacement is Sh.15,000 per year.

6. Recent sales price and projected net income for properties comparable to Furaha Property Investment Limited are shown below:

	Property A	Property B	Property C
Price (Sh.)	3,525,000	4,875,000	2,350,000
Net operating income (Sh.)	246,750	438,750	188,000

7. Fatuma Juma intends to consider an alternative capitalisation rate using a band of investment technique. If the investment is made, Furaha Property Investment Limited will pay 20% in cash and finance the remainder over a period of 30 years. Given the prevailing terms of 7% a year on a 30-year mortgage with monthly payments, the mortgage constant will be 0.0719.
8. Fatuma Juma believes that the equity capitalisation rate is 10%.

**Required:**

- (i) Furaha Property Investment Limited's net operating income (NOI) for year 2017. (5 marks)
- (ii) The investment value of the property using the direct capitalisation approach. (3 marks)
- (iii) The overall capitalisation rate using the band of investment technique. (2 marks)

**(Total: 20 marks)**

**QUESTION FIVE**

- (a) Evaluate two managed futures trading strategies. (4 marks)
- (b) Discuss how each of the following factors would most likely affect the prepayment risk of the mortgage-backed pass through securities:
  - (i) Coupon rate of the mortgage. (2 marks)
  - (ii) Age of the mortgage. (2 marks)
  - (iii) Seasonality. (2 marks)

- (c) A passive manager purchases a position worth Sh.50 million in underlying value of a commodities futures contract. The manager also buys Sh.50 million worth of 10-year Treasury bonds that pay an interest rate of 5% per annum. After the end of one month, the commodities futures contract position has appreciated by 2% and the price of the 10-year Treasury bond is unchanged.

**Required:**

The gain in the value of the position.

(2 marks)

- (d) An investor owns two 30-year original maturity mortgage-backed securities (MBS), MBS-A and MBS-B. He uses the 10-year Treasury yield as a relative measure to gauge the level of current 30-year home mortgage rates. Over the past four years, the 10-year Treasury yield has declined below 5.50% three times, subsequently rising above 6.50% each time. The 10-year Treasury yield is currently at 6.50%.

The following information relates to the two mortgage-backed securities:

Issue	Coupon (%)	Weighted average maturity (months)	Price (Sh.)	Current month	
				PSA	CPR
MBS-A	7.50	355	100	500	5
MBS-B	7.50	260	100	200	12

**Note:**

- PSA is the prepayment scale developed by Public Securities Association (PSA) for analysing mortgage-backed securities.
- CPR is the conditional prepayment rate, a loan prepayment rate equal to the proportion of the principal of a pool of loans assumed to be paid off prematurity in each period.

**Required:**

- Explain the difference in the prepayment sensitivity of the two securities assuming a future decline in the 10-year Treasury yield of slightly more than 100 basis points. (4 marks)
- Determine, with reasons, the security that would realise a higher percentage of principal prepayment, based on the current month PSA and CPR prepayment data. (2 marks)
- Describe two reasons why prepayments are likely to be more stable for automobile receivable asset-backed securities when compared to similar duration mortgage-backed securities. (2 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:

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

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