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CIFA PART III SECTION 5

ALTERNATIVE INVESTMENTS ANALYSIS

THURSDAY: 24 May 2018. **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) Summarise three reasons why many private equity sponsors tend to favour mezzanine financing over high-yield funding. (3 marks)

(b) Eliud Mulee inherited an apartment building. He initially intended to keep the building, but his lawyer suggested that he should consider selling the building and buy some undeveloped land at the outskirts of the city. The owner of the land had planned to build a shopping mall but now he is being forced to sell the land at a price below its appraised value.

Mulee's lawyer made the following comments:

1. The high occupancy rate of your apartment building exceeds the occupancy rate of comparable local apartment buildings. As a result, the apartments will not have much potential for price appreciation.
2. Although the investment in the undeveloped land will not provide immediate cash flow, its long-term potential for price appreciation is significant because one can develop a shopping mall on the land.

Required:
Critique each of the above statements. (4 marks)

(c) An alternative investment analyst gathers the following values for distributions, contributions and net asset value (NAV) for a Ugandan private equity fund named Fox Fund 1 that belongs to the vintage year 2011:

Year	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Fox Fund 1 (Sh."million")	–200	–800	200	–2,000	–600	2,000	3,500

Positive numbers correspond to the years in which investors received net distributions while the negative numbers correspond to years in which investors made net contributions. The figure for 2017 corresponds to the net asset value at the end of that year.

Required:
Compute the following for the fund:

(i) Interim internal rate of return. (3 marks)

(ii) The total value to paid-in ratio. (2 marks)

(iii) The distribution to paid-in ratio. (2 marks)

(iv) The residual value to paid-in ratio. (2 marks)

(d) Samuel Mwangi has invested in several real estate holdings in a country with a capital gains tax rate of 30%. One of these holdings is land with a current market value of Sh.15 million. He intends to utilise its value to generate liquidity. Samuel is considering monetising his property either through mortgage financing or sale and lease back.

The property has a cost basis for tax purposes equal to 15% of its current market value. He can achieve a loan-to-value ratio of 75% through a mortgage financing at an interest rate of 8%. Lease payments and mortgage financing are both deductible for tax purposes. He wants to determine how much liquidity each method will generate upon closing.

Required:
Calculate the initial net proceeds if Samuel opts to use:

(i) Mortgage financing method. (2 marks)

(ii) Sale and lease back method. (2 marks)

(Total: 20 marks)

QUESTION TWO

(a) In the context of participants in the alternative investments market, evaluate four advantages of separately managed accounts (SMAs) relative to mutual funds. (4 marks)

(b) Explain three factors that could affect prepayments in a mortgage pass-through security. (3 marks)

(c) In relation to asset backed securities (ABS), differentiate between "prepayment tranching" and "credit tranching". (2 marks)

(d) An alternative investment firm is considering equity investments in real estate. The two options under consideration are as illustrated below:

Option 1: Investment in a public real estate investment trust (REIT).
Option 2: Equity investment in a public real estate operating company (REOC)

Option 1: REIT

Recent net operating income (NOI)	Sh.140 million
Non-cash rents	Sh.5 million
Full year adjustment for acquisition	Sh.5 million
Other assets	Sh.50 million
Total liabilities	Sh.300 million
Current market price per share	Sh.125
Shares outstanding	15 million
Going in capitalisation rate	7.0%
Net operating income growth rate	2.5%

Option 2: REOC

Expected Adjusted Funds From Operations (AFFO) in year 8	Sh.13.5 million
Holding period	7 years
Present value of all dividends for 7 years	Sh.39.7 million
Shares outstanding	1.0 million
Capitalisation rate	7.0%
Growth rate from year 8	2.50%

Additional information:

1. The REOC terminal value at the end of seven years is to be based on a price-to-AFFO multiple of 12 times.
2. The real estate market expectations are that mortgage rates are likely to remain low for at least seven more years and the economy is expected to enjoy above average growth rate.

Required:

(i) Using the net asset value approach, determine whether the REIT identified in Option 1 is fairly priced. (3 marks)

(ii) Using the discounted cash flow approach, calculate the estimated value per share of Option 2. (3 marks)

(iii) Provide one reason why Option 2 would be preferred over Option 1. (1 mark)

(e) An asset management firm is reviewing various mortgage backed securities (MBS) and is interested in calculating the single monthly mortality (SMM) rates. The firm is using the Public Securities Association (PSA) standard prepayment benchmark.

Required:

(i) The SMM for month 22 assuming a 140PSA. (2 marks)

(ii) The SMM for month 200 assuming a 90 PSA. (2 marks)

(Total: 20 marks)

QUESTION THREE

(a) Discuss four factors that have contributed to the convergence of private equity and hedge fund strategies in the global markets. (4 marks)

(b) Cetric Mayfair hedge fund employs the following three hedge fund strategies:

1. Quantitative long/short fund.
2. Arbitrage/relative value fund.
3. Fund of funds

Required:

For each of the above hedge fund strategies, propose:

(i) The underlying assumptions. (3 marks)

(ii) The investment strategies. (3 marks)

(iii) The potential downside exposures. (3 marks)

(c) A portfolio consists of 100 credits, each having a notional value of Sh.10 million. An investor is interested in a tranche having the notional value of Sh.50 million with an attachment of 5% and a width of 2%. The spread is 150 basis points. The recovery rate is 40%. The tranche will not experience any loss until there are nine defaults.

Required:

(i) Calculate the amount paid by the protection seller to the protection buyer. (3 marks)

(ii) Calculate the amount paid by the protection buyer to the protection seller. (1 mark)

(d) A fund has invested in a two commodity portfolio, A and B, with a beginning value of Sh.100 million. Over the upcoming two periods, the return on commodity A will be 100% in period 1 and – 50% in period 2. The rate of return on commodity B will be 0% in period 1 and 0% in period 2.

The allocation to each commodity is 50%. The portfolio is rebalanced after each period.

Required:
Calculate the geometric return of the portfolio. (3 marks)
(Total: 20 marks)

QUESTION FOUR

(a) Explain the following terms as used in private equity investment:

(i) Carried interest. (1 mark)

(ii) Clawback clause. (1 mark)

(b) Discuss two uses of credit derivatives. (2 marks)

(c) The asset backed securities (ABS) market has grown in the past few years partly as a result of credit enhancements to ABS.

Required:

(i) In relation to the above statement, differentiate between a "letter of credit" and "early amortisation" (2 marks)

(ii) Explain to the investor the risk associated with relying exclusively on letter of credit and early amortisation. (2 marks)

(d) SCM Capital is a hedge fund with an initiator investment capital of Sh.100 million. The hedge fund charges a 2% management fee based on assets under management at year end and a 20% incentive fee. In its first year, SCM Capital has a 30% return. The fee structure specifies a hurdle rate of 5% and the incentive fee is based on returns in excess of the hurdle rate. The performance fee is calculated net of the management fee.

In the second year, the fund value declines to Sh.110 million. The fee structure in the second year includes the use of a high water mark (HWM). In the third year, the fund value increases to Sh.128 million. The fee structure in the third year includes the use of a HWM.

Required:

(i) Calculate the arithmetic mean annual return over the three-year period based on the fee structure specified above. (5 marks)

(ii) Calculate the total fee paid to SCM Capital over the three-year period. (1 mark)

(e) Simon Meso decided to sell one of his income producing properties in January 2018. He decided to use a direct capitalisation approach and a discounted cash flow approach to set the asking price for the property. The property information is provided below:

Property information

Capitalisation rate	13%
Mortgage:	none
Commissions	none

Year	Net Operating Income (Sh."000")
2018	43,300
2019	45,725
2020	43,271
2021	50,945

Required:

(i) Estimate the property's current value using the direct capitalisation method. (1 mark)

(ii) Discuss two shortcomings of the underlying assumptions and methodology of the direct capitalisation approach to valuation. (2 marks)

(iii) Calculate a discounted cash flow valuation of the property given that the property is sold at the end of year 2021. (3 marks)

(Total: 20 marks)

QUESTION FIVE

(a) Outline one limitation of cash flow duration in the mortgage backed securities market (MBS). (1 mark)

(b) In relation to commodities, discuss three misinterpretations of the roll return. (3 marks)

(c) An investor of assets backed securities (ABS) and mortgage backed securities (MBS) is concerned that there is a possibility of interest rates declining in the near future.

Required:

Explain the effect of the following assuming interest rates decline as expected:

(i) The cash flows of home-equity ABS. (2 marks)

(ii) The cash flows of the automobile receivable ABS. (2 marks)

(d) An analyst gathers the following information for collateralised mortgage obligation (CMO) tranches:

Tranche	Option Adjusted Spread (basis points)	Z-Spread (basis points)	Effective duration
1	68	85	2.60
2	71	91	2.90
3	73	136	8.25

Required:

Determine the most expensive tranche. (4 marks)

(e) James Ochieng is considering investing in two bonds, A and B. Bond A has a duration of 5.6 years and a convexity of 38.2. Bond B has a duration of 7.3 years and a convexity of 38.2.

Required:

Determine the bond that is more exposed to interest rate risk. (2 marks)

(f) A collateralised mortgage obligation (CMO) security has a floating rate tranche C. Tranche C has been split to create a floater with a principal of Sh.80,416,667 and an inverse floater with a principal of Sh.16,083,333 as shown below:

Tranche		Par Amount (Sh.)	Coupon (%)
A		194,500,000	7.50
B		36,000,000	7.50
C	Floater	80,416,667	
	Inverse floater	16,083,333	
D		73,000,000	7.50

Required:

(i) Determine the capitalisation rate for the inverse floater if the coupon rate for the floater is 1 month LIBOR plus 1%. (3 marks)

(ii) Determine the capitalisation rate on the floater assuming that the coupon formula for the floater is 1 month LIBOR plus 1%, and a floor of zero is imposed on the inverse floater. (3 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:

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

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