PGDM / IB Batch 2018-20

Business Analysis & Valuation

DM-412/IB-40[illegible] 7

Trimester – IV, End-Term Examination: September 2019

Time allowed: 2.5 Hours | Max Marks: 50

Roll No: _____

Instruction: Students are required to write Roll No on every page of the question paper, writing anything except the Roll No will be treated as **Unfair Means.** In case of rough work please use answer sheet.
Make assumptions wherever necessary and write them down at the end of solution.

Sections	No. of Questions to attempt	Marks	Marks
A	3 Questions	10 Marks each	3*10 = 30
B	Compulsory Case Study	20 Marks	20
		Total Marks	**50**

SECTION A

A 1. The TCM Petroleum Corporation is an integrated oil company headquartered in Fort Worth, Texas. Historical income statements for 2014 and 2015 are found below (dollar figures are in the millions):

	December 2015	December 2014
Sales	$ 13,368.00	$12,211.00
Cost of goods sold	(10,591.00)	(9,755.00)
Gross profit	2,777.00	2,456.00
Selling, general, and administrative expense	(698.00)	(704.00)
Operating income before depreciation	2,079.00	1,752.00
Depreciation, depletion, and amortization	(871.00)	(794.00)
Operating profit	1,208.00	958.00
Interest expense	(295.00)	(265.00)
Nonoperating income or expense	151.00	139.00
Special items		20.00
Pretax income	1,064.00	852.00
Taxes	(425.60)	(340.80)
Net income	$ 638.40	$ 511.20

In 2014, TCM made capital expenditures of $875 million, followed by $1,322 million in 2015. TCM also invested an additional $102 million in net working capital in 2014, followed by a decrease in its investment in net working capital of $430 million in 2015.
a. Calculate TCM's FCFs for 2014 and 2015. TCM's tax rate is 40%.
b. Estimate TCM's FCFs for 2016 to 2020 using the following assumptions: Operating income continues to grow at 10% per year over the next five years, CAPEX is expected to be $1,000 million per year, new investments in net working capital are expected to be $100 million per

year, and depreciation expense equals the prior year's total plus 10% of the prior year's CAPEX.

(CILO 2)

OR

A 2. The following information provides the basis for performing a straightforward application of the adjusted present value (APV) model.

Assumptions
Unlevered cost of equity 12%
Borrowing rate 8%
Tax rate 30%
Current debt outstanding $200.00

	Years			
	1	2	3	4 and Beyond
Firm FCFs	$100.00	$120.00	$180.00	$200.00
Interest-bearing debt	200.00	150.00	100.00	50.00
Interest expense	16.00	12.00	8.00	4.00
Interest tax savings	4.80	3.60	2.40	1.20

a. What is the value of the firm, assuming that it's FCFs for year 5 and beyond are equal to the year 4 free cash flow and firm's interest tax savings, assuming that they remain constant for year 4 and beyond?
b. What is the value of the firm if company maintains 1:1 debt-equity ratio instead?

(CILO 2)

A 3 The CFO of Sterling Chemical is interested in evaluating the cost of equity capital for his firm. However, Sterling uses very little debt in its capital structure (the firm's debt-to-equity capitalization ratio is only 20%), while larger chemical firms use substantially higher amounts of debt. The following table shows the levered equity betas, debt-to-equity ratios, and debt betas for three of the largest chemical firms:

Company Name	Levered Equity Betas	Debt/Equity Capitalization	Assumed Debt Betas
Eastman Chemical Co. (EMN)	1.79	30.77%	0.30
Celanese Corp. (CE)	1.98	23.55%	0.30
Dow Chemical Company (DOW)	1.71	21.60%	0.30

a. Use the information given above to estimate the unlevered equity betas for each of the companies.
b. If Sterling's debt-to-equity capitalization ratio is .20 and its debt beta is .30, what is your estimate of the firm's levered equity beta?

(CILO 3)

OR

A 4. On behalf of your firm, you are evaluating a privately held takeover target. The table below contains cost of capital metrics for two comparable publicly traded firms that are in the same general business and are similar in size compared to the acquisition target. You decide to equally weight all the comp data to estimate the correct discount rate to use in valuing the target. The target will be financed with 20% debt, with a pretax cost of debt equal to 4%, and the debt beta is assumed to equal 0. Assume that all of the firms in your analysis are in the 35% tax bracket and that all of the firms have a policy to leave their debt ratio constant. Answer the following questions regarding the correct cost of capital to use in valuing the target. For all parts of this problem, assume a risk-free rate of 3% and a market risk premium of 6%.

Comp Company	Equity Beta	Debt Beta	D/E
Comp 1	1.5	.2	15%
Comp 2	2.1	.2	30%

a. What is the estimated firm or asset (unlevered equity) beta for the target firm based on the comp data?
b. What is the estimated levered cost of equity for the target based on the comp data and the target's debt/value ratio of 20%?
c. Using the equity cost already calculated and the information on the cost of debt in the problem, what is the WACC to use in discounting the target's projected firm free cash flows?
(CILO 3)

A 5 (i). As a summer intern, you are asked to prepare a spreadsheet calculating the project free cash flow associated with a project your employer is considering. Initially your boss assumes that no debt will be used to fund the project. During your presentation to the committee that evaluates projects, you learn that, in fact, the project will be financed with 25% debt. Determine whether the following statements are true or false, and explain your answer:
a. You need to go back to your office and adjust the project's free cash flows to include the interest on the debt.
b. You need to go back to your office and adjust the project cash flows to update the taxes paid due to the tax shield provided by taking on debt.
c. Your cash flow model does not need to be updated because the financing of the project does not affect the free cash flow calculation.

A 5 (ii). Cash from Operations and Free Cash Flow The item called "cash provided by operations" in the cash flow statement sounds a lot like firm free cash flow. Although these two quantities are related, they are not the same. Discuss the sources of difference between them.
(CILO1)

OR

A 6. DCF valuation though a sound way of valuing an opportunity, may not be useful in all the business conditions. What are other value enhancement techniques you may use? (CILO1)

Section B

Randy is the chief investment officer for Cleanstone Capital. Cleanstone is a private equity firm located in Orlando, Florida, that specializes in what Randy describes as make-over or fixer-upper investments. The firm tries to find privately held firms whose owners tried to grow their business too fast and ran into liquidity problems. Cleanstone has been in this business for eleven years and has had reasonable success.

Cleanstone is now completing the investment of its second fund and considering the acquisition of a local manufacturing and distribution company, Flanders Inc. Flanders was founded by Mark Flanders eighteen years ago and grew rapidly. Recently, however, the firm made a large acquisition of a competitor firm, and the problems the firm encountered when assimilating the acquisition led to financial difficulties for Flanders. The owner has recently voiced his interest in a buyout proposal to his local banker, who notified Randy (his next-door neighbour) of the opportunity.

Randy contacted Mark, and the two decided to open a dialogue about the possible acquisition of Mark's firm. After several meetings, Mark decided to solicit an offer from Cleanstone. In response to Randy's request, Mark supplied him with the following set of pro forma income statements spanning 2016 to 2020:

Pro Forma Income Statements

	2016	2017	2018	2019	2020
EBITDA	11,000,000	12,100,000	13,310,000	14,641,000	16,105,100
Less depreciation	(3,900,000)	(4,300,000)	(4,700,000)	(5,100,000)	(5,500,000)
EBIT	7,100,000	7,800,000	8,610,000	9,541,000	10,605,100
Less: interest	(6,300,000)	(6,235,600)	(6,040,288.80)	(5,690,457.10)	(5,159,103.90)
EBT	800,000	1,564,400	2,569,711.20	3,850,542.90	5,445,996.10
Less: taxes	(240,000.00)	(469,320.00)	(770,913.36)	(1,155,162.87)	(1,633,798.83)
Net income	560,000.00	1,095,080.00	1,798,797.84	2,695,380.03	3,812,197.27

In addition, Randy asked Mark to estimate capital expenditures for each of the next five years. Mark indicated that he thought the firm would have to spend about $4 million a year and that the new asset would have a ten-year depreciable life. (Depreciation expense for 2015 was $3.5 million so the addition of $4 million in capital expenditures will add $400,000 in added depreciation expense for 2016.) Mark indicated to Randy that his research suggested that a five-times-EBITDA multiple would be appropriate. Randy, however, was not sure that Cleanstone could afford to pay this much for the firm. He decided to do a quick analysis of valuation based on the following assumptions:

- The firm can be purchased for five times the firm's 2015 EBITDA of $10 million and resold in five years for the same multiple of the firm's year 5 EBITDA.
- Cleanstone will finance 90% of the purchase price using debt that carries a 14% rate of interest. The debt will require a cash sweep so that all available cash flow will go toward the repayment of the note.
- A tax rate of 30% is assumed in all calculations.
- Capital expenditures (CAPEX) are estimated to be $4 million per year, and no net new investments in working capital are anticipated.

Required:

a. What is the projected enterprise value of Flanders in five years as per EBITDA multiple? What is the estimated value of Cleanstone's equity in the firm at the end of five years if everything works out as planned?

b. What rate of return should Clearstone expect on its equity in the acquisition under the projections made above?

C If risk free rate and equity risk premium happens to be at 5% and asset beta is assumed at 1.2, what will be Flanders valuation according to APV method? Assume FCF level will remain constant beyond 2020 and debt level of 2020 will be maintained. (CILO3)

Present Value Table

Present value of 1 i.e. $(1 + r)^{-n}$

Where r = discount rate
n = number of periods until payment

Discount rate (r)

Periods (n)	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	
1	0·990	0·980	0·971	0·962	0·952	0·943	0·935	0·926	0·917	0·909	1
2	0·980	0·961	0·943	0·925	0·907	0·890	0·873	0·857	0·842	0·826	2
3	0·971	0·942	0·915	0·889	0·864	0·840	0·816	0·794	0·772	0·751	3
4	0·961	0·924	0·888	0·855	0·823	0·792	0·763	0·735	0·708	0·683	4
5	0·951	0·906	0·863	0·822	0·784	0·747	0·713	0·681	0·650	0·621	5
6	0·942	0·888	0·837	0·790	0·746	0·705	0·666	0·630	0·596	0·564	6
7	0·933	0·871	0·813	0·760	0·711	0·665	0·623	0·583	0·547	0·513	7
8	0·923	0·853	0·789	0·731	0·677	0·627	0·582	0·540	0·502	0·467	8
9	0·914	0·837	0·766	0·703	0·645	0·592	0·544	0·500	0·460	0·424	9
10	0·905	0·820	0·744	0·676	0·614	0·558	0·508	0·463	0·422	0·386	10
11	0·896	0·804	0·722	0·650	0·585	0·527	0·475	0·429	0·388	0·350	11
12	0·887	0·788	0·701	0·625	0·557	0·497	0·444	0·397	0·356	0·319	12
13	0·879	0·773	0·681	0·601	0·530	0·469	0·415	0·368	0·326	0·290	13
14	0·870	0·758	0·661	0·577	0·505	0·442	0·388	0·340	0·299	0·263	14
15	0·861	0·743	0·642	0·555	0·481	0·417	0·362	0·315	0·275	0·239	15

(n)	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%	
1	0·901	0·893	0·885	0·877	0·870	0·862	0·855	0·847	0·840	0·833	1
2	0·812	0·797	0·783	0·769	0·756	0·743	0·731	0·718	0·706	0·694	2
3	0·731	0·712	0·693	0·675	0·658	0·641	0·624	0·609	0·593	0·579	3
4	0·659	0·636	0·613	0·592	0·572	0·552	0·534	0·516	0·499	0·482	4
5	0·593	0·567	0·543	0·519	0·497	0·476	0·456	0·437	0·419	0·402	5
6	0·535	0·507	0·480	0·456	0·432	0·410	0·390	0·370	0·352	0·335	6
7	0·482	0·452	0·425	0·400	0·376	0·354	0·333	0·314	0·296	0·279	7
8	0·434	0·404	0·376	0·351	0·327	0·305	0·285	0·266	0·249	0·233	8
9	0·391	0·361	0·333	0·308	0·284	0·263	0·243	0·225	0·209	0·194	9
10	0·352	0·322	0·295	0·270	0·247	0·227	0·208	0·191	0·176	0·162	10
11	0·317	0·287	0·261	0·237	0·215	0·195	0·178	0·162	0·148	0·135	11
12	0·286	0·257	0·231	0·208	0·187	0·168	0·152	0·137	0·124	0·112	12
13	0·258	0·229	0·204	0·182	0·163	0·145	0·130	0·116	0·104	0·093	13
14	0·232	0·205	0·181	0·160	0·141	0·125	0·111	0·099	0·088	0·078	14
15	0·209	0·183	0·160	0·140	0·123	0·108	0·095	0·084	0·074	0·065	15

Annuity Table

Present value of an annuity of 1 i.e. $\frac{1-(1+r)^{-n}}{r}$

Where r = discount rate
n = number of periods

Discount rate (r)

Periods (n)	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	
1	0·990	0·980	0·971	0·962	0·952	0·943	0·935	0·926	0·917	0·909	1
2	1·970	1·942	1·913	1·886	1·859	1·833	1·808	1·783	1·759	1·736	2
3	2·941	2·884	2·829	2·775	2·723	2·673	2·624	2·577	2·531	2·487	3
4	3·902	3·808	3·717	3·630	3·546	3·465	3·387	3·312	3·240	3·170	4
5	4·853	4·713	4·580	4·452	4·329	4·212	4·100	3·993	3·890	3·791	5
6	5·795	5·601	5·417	5·242	5·076	4·917	4·767	4·623	4·486	4·355	6
7	6·728	6·472	6·230	6·002	5·786	5·582	5·389	5·206	5·033	4·868	7
8	7·652	7·325	7·020	6·733	6·463	6·210	5·971	5·747	5·535	5·335	8
9	8·566	8·162	7·786	7·435	7·108	6·802	6·515	6·247	5·995	5·759	9
10	9·471	8·983	8·530	8·111	7·722	7·360	7·024	6·710	6·418	6·145	10
11	10·368	9·787	9·253	8·760	8·306	7·887	7·499	7·139	6·805	6·495	11
12	11·255	10·575	9·954	9·385	8·863	8·384	7·943	7·536	7·161	6·814	12
13	12·134	11·348	10·635	9·986	9·394	8·853	8·358	7·904	7·487	7·103	13
14	13·004	12·106	11·296	10·563	9·899	9·295	8·745	8·244	7·786	7·367	14
15	13·865	12·849	11·938	11·118	10·380	9·712	9·108	8·559	8·061	7·606	15

(n)	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%	
1	0·901	0·893	0·885	0·877	0·870	0·862	0·855	0·847	0·840	0·833	1
2	1·713	1·690	1·668	1·647	1·626	1·605	1·585	1·566	1·547	1·528	2
3	2·444	2·402	2·361	2·322	2·283	2·246	2·210	2·174	2·140	2·106	3
4	3·102	3·037	2·974	2·914	2·855	2·798	2·743	2·690	2·639	2·589	4
5	3·696	3·605	3·517	3·433	3·352	3·274	3·199	3·127	3·058	2·991	5
6	4·231	4·111	3·998	3·889	3·784	3·685	3·589	3·498	3·410	3·326	6
7	4·712	4·564	4·423	4·288	4·160	4·039	3·922	3·812	3·706	3·605	7
8	5·146	4·968	4·799	4·639	4·487	4·344	4·207	4·078	3·954	3·837	8
9	5·537	5·328	5·132	4·946	4·772	4·607	4·451	4·303	4·163	4·031	9
10	5·889	5·650	5·426	5·216	5·019	4·833	4·659	4·494	4·339	4·192	10
11	6·207	5·938	5·687	5·453	5·234	5·029	4·836	4·656	4·486	4·327	11
12	6·492	6·194	5·918	5·660	5·421	5·197	4·988	4·793	4·611	4·439	12
13	6·750	6·424	6·122	5·842	5·583	5·342	5·118	4·910	4·715	4·533	13
14	6·982	6·628	6·302	6·002	5·724	5·468	5·229	5·008	4·802	4·611	14
15	7·191	6·811	6·462	6·142	5·847	5·575	5·324	5·092	4·876	4·675	15