FIN 521: MIL Exercise

Due on Friday, March 30, 2018

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Part 1

I chose PEPSICO INC. which is famous multinational food, snack, and beverage corporation. Most of data used in evaluating share price is come from CapitalIQ, and if data which is necessary to evaluate stock price is unobserved, it is estimated by myself.

a) I collected analyst's forecast of sales revenue of PepsiCo over next seven years. Table 1 shows the estimated revenue. Estimated revenue grows moderately.

b) Analyst's forecast data of company's EBITDA from FY2018 to FY2022 is collected from CapitalIQ, and since the average EBITDA growth is about 6% per year, I assumed that EBITDA will grow at 6% over the last 2 years. Table 1 shows the estimated EBITDA. Using this data, EBITDA/Sales margin was calculated. Table 2 shows estimated EBITDA/Sales margin.

c) In order to estimate free cash flow, estimation for EBIT is needed first. As mentioned above, EBITDA was estimated by using analyst's forecast and by estimation of growth. Depreciation and amortization is estimated by estimating depreciation margin which is (Depreciation / Sales Revenue). Depreciation margin is estimated by averaging past 3 years' margin, and is assumed constant over 7 years. The margin was calculatd as 3.44%. Tax rate used for calculating tax affected EBIT is 21%. Changes in net working capital is estimated by estimating days in receivables, inventory, payables and others. They were estimated by averaging past 3 years' data and were assumed to be constant over 7 years. Table 3 shows estimated days of each account. Capital expenditure is estimated by estimating CapEx margin, which was calculated by averaging past 3 year's data. From the procedure, free cash flow was calculated as Table 1.

d) Since the food, snack and beverage industry is matured enough, it does not seem that the company will grow fast. Therefore,it is reasonable to assume that long run growth rate of free cash flow will be stable. Therefore, I chose the appropriate long run growth rate as 2%.

e) In order to calculate WACC of PepsiCo, cost of equity and cost of debt was calculated first. Using CapitalIQ's data, equity beta of the company is estimated as about 0.7. Since the given risk-free rate and market risk premium is 2% and 5%, respectively, using CAPM, cost of equity of the firm is calculated as $2\% + 0.7 \times 5\% = 5.53\%$. (Equity beta is slightly larger than 0.7 in actual.) Since the credit rating of the firm is A+, debt beta is estimated as 0.05. Then by using CAPM, cost of debt is calculated as 2.25%. Applying tax benefit to cost of debt, after tax cost of debt is calculated as 1.78%. From the balance sheet of the firm, proportion of equity financing is about 80.27%, and proportion of debt financing is about 19.73%. Using this data, WACC of the firm is calculated as 4.79%.

f) Using the long run growth rate and WACC calculated in d) and e), by using perpetuity formula, terminal value is calculated as 443,148.(million dollars) Discounted terminal value is calculatd as 319,444, and

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	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024
Revenues	65,373	67,472	69,619	71,229	73,403	77,621	80,373
Gross Profit	35,782	36,931	38,105	38,987	40,176	42,485	43,992
EBITDA	13,627	14,402	15,129	16,286	17,188	18,219	19,312
Depreciation/Amortization	2,248	2,321	2,394	2,450	2,525	2,670	2,764
Operating Income	11,378	12,081	12,735	13,836	14,663	15,550	16,548
Taxes	2,389	2,537	2,674	2,906	3,079	3,265	3,475
Tax Affected EBIT	8,989	9,544	10,060	10,931	11,584	12,284	13,073
Depreciation/Amortization	2,248	2,321	2,394	2,450	2,525	2,670	2,764
Changes in Working Capital	382	(6)	(6)	(5)	(6)	(12)	(8)
Capital Expenditures	(3,026)	(3,124)	(3,223)	(3,298)	(3,398)	(3,593)	(3,721)
Unlevered Free Cash Flow	8,593	8,735	9,226	10,078	10,704	11,348	12,109

Table 1: Estimated Income Statement and Expected Cash Flow

	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024
Sales Growth	2.91%	3.21%	3.18%	2.31%	3.05%	5.75%	3.55%
Gross Margin	54.73%	54.73%	54.73%	54.73%	54.73%	54.73%	54.73%
EBITDA Margin	20.84%	21.34%	21.73%	22.86%	23.42%	23.47%	24.03%
Depreciation Margin	3.44%	3.44%	3.44%	3.44%	3.44%	3.44%	3.44%
CapEx Margin	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%	4.63%

Table 2: Estimated Margins

present value of estimated free cash flow is calculated as about 58,306. Therefore, enterprise value of the firm is estimated as $319,444 + 58,306 = 377,750$.

g) From the balance sheet of the firm, total amount of debt is 39,281 and amount of cash is 10,610. Therefore, equity value is calculated as $377,750 - 39,281 + 10,610 = 349,079$. Considering there are 1,420(million) shares outstanding, the share price is calculated as $245.85 per share.

h) Table 4 shows sensitivity analysis by changing EBITDA margins, long run growth rate, equity beta and market risk premium. It can be found that share price is very sensitive to equity beta. Of course, price is also sensitive to other factors, but considering that estimation of equity beta is more difficult than other factors, it is hard to say that the estimated share price is reliable.

	FY2015	FY2016	FY2017	Average
Days in AR	37	39	40	39
Days in Inventory	35	35	37	36
Prepaid Days	14	11	19	19
Days in AP	70	80	85	85
Days in Accruals	52	55	53	53

Table 3: Estimated days

EBITDA Margin	Price	Equity Beta	Price	Risk Premium	Price	Growth Rate	Price
-5%	177.59	0.2	985.91	2.5%	546.13	0.01	184.82
-4%	191.88	0.3	635.13	3.0%	445.67	0.015	210.69
-3%	206.18	0.4	464.98	3.5%	375.24	0.02	245.85
-2%	220.47	0.5	364.51	4.0%	323.13	0.025	296.38
-1%	234.76	0.6	298.22	4.5%	283.02	0.03	375.18
0%	245.85	0.7	245.85	5.0%	245.85		
1%	263.34	0.8	216.11	5.5%	225.32		
2%	277.64	0.9	188.94	6.0%	203.89		
3%	291.93	1	167.27	6.5%	185.83		
4%	306.22	1.1	149.60	7.0%	170.42		
5%	320.51	1.2	134.91	7.5%	157.11		

Table 4: Sensitivity Analysis

Part 2

In order to use comps method, I chose three firms, Coca Cola Company, Dr. Pepper Snapple Group, and Monster Beverage Corp. All of three are American beverage company like PepsiCo.

a) In order to value the firm, the average P/E ratio of comparable companies is used. Table 5 represents P/E ratio of comparable firms. Considering PepsiCo's net income and number of outstanding shares are

	Coca Cola	Dr.Pepper	Monster	Average
Price	42.89	118.28	56.25	72.47
P/E Ratio	38.92	27.73	39.61	35.42

Table 5: P/E Ratio of Comparable Firms

$4,857(million), and 1,420 million shares, respectively, using the average P/E ratio, price of PepsiCo per share is estimated as $4,857 \times 35.42/1,420 = 121.16$.

b) In this case, EV/EBITDA is used for evaluating PepsiCo's share price. Table 6 represents EV/EBITDA of compariable firms. Since PepsiCo's current EBITDA is 12,723, estimated enterprise value is $12,723 \times$

	Coca Cola	Dr.Pepper	Monster	Average
EV	211035	25711	31010	89252
EBITDA	10870	1579	1283	4577
EV/EBITDA	19.41	16.28	24.17	19.96

Table 6: EV/EBITDA of Comparable Firms

$19.96 = 253,891.4$. Considering total amount debt is equal to 39,281 and there is 10,610 amount of cash, equity value is calculated as $253,891.4 - 39,821 + 10,610 = 225,220.4$. Dividing equity value by number of shares(1,420), price per share is estimated as 158.62.

Part 3

In this case, comps method is more appropriate to evaluate share price than using DCF method. Although DCF method has more rigorous theoretical background, it might less reliable because implementation of the method is difficult because estimation of future cash flow and cost of capital is difficult. As shown in sensitivity analysis, share price of the firm is sensitive of lots of parameters which is not guaranteed to be estimated correctly. Of course, comps method also has some caveats like comparable companies choosing issue. However, as long as appropriate companies are found, evaluating share price is much easier and more accurate. Since all of comparable companies used in this case have similar industrial background, they might have similar multiples as PepsiCo's. Therefore, comps method might be more appropriate to evaluate PepsiCo's price. Since the current stock price of Pepsi is \$112.81, it can be found that evaluated price in all methods is higher than market price. Therefore, we can conclude that the market price of Pepsi is underpriced.