FIN 521: Problem Set #1

Due on Wednesday, February 7, 2018

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Question 1

Ratios stated on the problem set are calculated as follows.

a. Market/Book = Market Capitalization / Book value of equity

b. Interest coverage = Some measure of income(operating income, EBIT, EBITDA ...) / Interest payments

c. EV/EBITDA = Enterprise value / EBITDA = Market value of equity + Debt - Cash / EBITDA

d. Market leverage = Debt / Equity

e. Current ratio = Current assets / Current liabilities

Table 1 shows numerical values of ratios calculated by using data from Global Corp's financial statement.

	Definition		Numerical Values		
Name of Ratio	Numerator	Denominator	Numerator	Denominator	Ratio
Market/Book	Market Cap.	Book value of equity	36	22.2	1.62
Interest Coverage	Operating income	Interest payments	10.4	7.7	1.35
EV/EBITDA	Enterprise value	EBITDA	131.5	11.6	11.34
Market Leverage	Debt	Equity	147.9	170.1	0.87
Current Ratio	Current assets	Current liabilities	57	34.7	1.64

Table 1: Financial ratios of Global Corp. (Unit: million dollars)

Question 2

a. In this case, \$20 million of cash would be credited, and same amount of long-term debt would be debited. Since the same amount of account in balance sheet have been offset, there is no change in Global's book value of equity.

b. Inventory would decrease by \$5 million, and there would be also a decrease of book value of equity by \$5 million.

c. Since the firm used cash and long-term debt to purchase building, cash amount of \$5 million would be credited, long-term debt amount of \$5 million would be credited, and \$10 million amount of PP&E would be debited. Since the amount of credited and debited balance sheet account is exactly equal, there is no change in Global's book value of equity.

Question 2 continued on next page. . .

d. Because there is no possibility that Global would ever receive payment, there would be a decrease of accounts receivable by $3 million dollars, as would the book value of equity.

e. Reduction of cost might affect income statement. It might reduce cost of good sold. However, balance sheet of the firm does not change due to this event.

f. The balance sheet does not change since the announcement of key competitor is not an economic event.

Question 3

a. According to the balance sheet of Starbucks for fiscal year 2013, the firm's cash and cash equivalent worth $2,575.7m, and short-term investments worth $658.1m. (How much of this amount is abroad? How was this money invested?)

b. From the balance sheet of Starbucks, the firm has $549.6m amount of debts.

Operating Accounts		Financial Accounts	
Net Working Capital		*Net Debt*	
Accounts receivable, net	561.40	Long-term debt	1,299.40
Inventories	1,111.20	Other long-term liabilities	357.70
Prepaid expenses and other current assets	287.70	Cash and cash equivalents	(2,575.70)
Deferred revenue	(653.70)	Deferred income taxes, net	(277.30)
Accounts payable	(491.70)	Short-term investments	(658.10)
Accrued litigation charge	(2,784.10)	Long-term investments	(58.30)
Insurance reserves	(178.50)	Equity and cost investments	(496.50)
Accrued liabilities	(1,269.30)	Deferred income taxes, net	(967.00)
TOTAL NET WORKING CAPITAL	(3,417.00)	TOTAL NET DEBT	(3,375.80)
Net Fixed Assets		*Shareholder's Equity*	
Property, plant and equipment, net	3,200.50	Shareholder's Equity	4,482.30
Other assets	185.30		
Other intangible assets	274.80		
Goodwill	862.90		
TOTAL NET FIXED ASSETS	4,523.50		
NET OPERATING ASSETS	1,106.50	NET BOOK CAPITAL	1,106.50

Table 2: Rearranged Balance Sheet

c.

Question 3 continued on next page...

d.

e.

f.

g. P/E ratio is calculated by (*Market capitalization / Net income*) or (*Share price / EPS*). It can describe whether value of firm is overvalued or undervalued. Since

Question 4

According to the question, expected cash flow stream of the project is as follows. The payback period of this

Year	*year 0*	*year 1*	*year 2*	*year 3*	*year 4*	*year 5*
Cash flows	-10	5	2	2	2	2

Table 3: Expected Cash Flows

project is 4 years because cumulative cash flow from year 1 to year 4 is 11, and that from year 1 to year 3 is 10. That means it takes four years to retake the initial investment. If the required payback period is two years, the project is not accepted since the payback period is larger than required period. Since the cost of capital is given as 10%, NPV of project is calculated as follows.

$$\begin{aligned} NPV &= -10 + \frac{5}{(1+0.1)} + \frac{2}{(1+0.1)^2} + \frac{2}{(1+0.1)^3} + \frac{2}{(1+0.1)^4} + \frac{2}{(1+0.1)^5} \\ &= 0.309 \end{aligned}$$

Therefore, the project has a positive NPV, and it means that the project is accepted if we use NPV rule.

Question 5

a. By using NPV formula, we can plot (cost of capital, NPV) on 2-D space. Figure 1 represents plot a function of NPV on r of the project. Decreasing curve on figure 1 represent the NPV curve, and the horizontal line represents NPV = 0, and the vertical line represents cost of capital which makes NPV equals to 0. Therefore, the x-point in which the vertical and horizontal line cross is IRR of the project.

b. By some numerical procedures, IRR is calculated as 12.72%. It is consistent to figure 1 since the x-value of the point in which the vertical and horizontal line cross is larger than 0.1.

c. Since IRR of the project is larger than cost of capital, the purchase is attractive based on IRR decision rule.

Question 5 continued on next page...

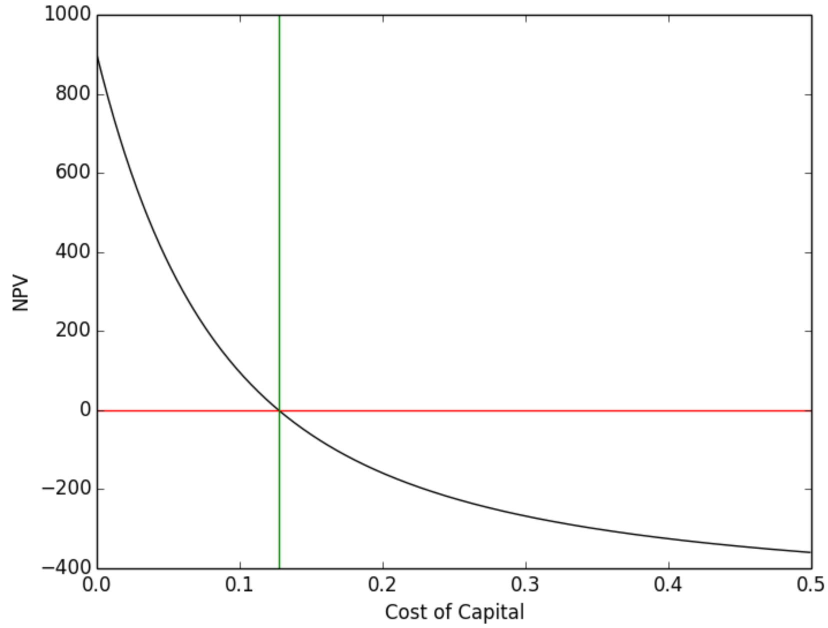

Figure 1: Plot of NPV

d. The decision would change if cost of capital of the project becomes larger than 12.72%. Regarding figure 1, we can find that if cost of capital of the project becomes larger than IRR(12.72%), NPV of the project would less than 0. It means that it is acceptable to purchase a new cruise ship unless cost of capital of this project becomes greater than 12.72%.

Question 6

Regarding event study, NPV of a project can be calculated by market capitalization before an announcement of project times rate of return after the announcement. In order to implement event study, data for market price of share and market capitalization of Bayer and Monsanto was collected. Since it is assumed that it would take about two days for disclosure information to be reflected, price data is collected from Sep 14 to Sep 16. Since the changes of return could be due to changes of whole markets, in order to eliminate that effects, returns of share price is adjusted by subtracting market index(S&P 500) return.

Question 7

From the perspective of capital budgeting, interest expense is ignored when calculating free cash flows. It is because we want to separate the investment and financial decisions. In order to calculate the free cash flow, the first thing have to do is calculating incremental earnings. It is calculated as *Incremental EBIT*(Incr.

Question 7 continued on next page…

Date		Bayer	Monsanto	S&P500
2016.9.14	Closing Price	103.4324	103.725	2125.77
2016.9.16	Closing Price	98.9536	100.51	2139.16
Return		-4.330%	-3.100%	0.630%
Adjusted Return		-4.960%	-3.729%	
Market Cap at 2016.9.14		87656.468	46715.613	
NPV		-4347.814	-1742.227	

Table 4: NPV of M&A decision

Revenues - Incr. Cost - Incr. Depreciation) $\times$ *(1 - Marginal tax rate)*. After that, make some adjustments to the incremental earning calculated before. Although the amount of depreciation is subtracted when calculating incremental earning, it is not an actual cash outflow. Therefore, we have to add depreciation again. However, it is incorrect not to subtract depreciation when calculating incremental earning because depreciation affects to the amount of tax. Hence, subtraction-and-addition procedure should be applied. Then, the amount of capital expenditure should be subtracted. It is because capital expenditure is actual cash outflow for the project, but it is not captured in income statement. Finally, the amount of changes in net working capital should be subtracted because an increase of net working capital ties up cash. Table 5 shows calculation of free cash flow of Cellular Access for this year. The free cash flow of Cellular Access for this year is calculated as 40 million dollars.

Account Subject	Value(million dollars)
EBIT	250
Tax Expense	100
Incremental Earnings	150
Depreciation	100
Capital Expenditure	200
Increase of Net Working Capital	10
Free Cash Flow	40

Table 5: Calculation of Free Cash Flow

Question 8