
A company plans to buy an equipment worth 150M and use this equipment for 5 years. This equipment is depreciated using straight line method and is expected to have a salvage value of 5M. The company expects an additional revenue of 50M every year starting next year from this equipment but annual cost is expected to go up by 15M.

The company's cost of equity is 5% and it finances the purchase with equity. Assume that the tax rate is 30%.

Find the cash flow at years 1-4.

Find the cash flow at the terminal year.

Find the NPV of the project.

$$WACC = R_d * W_d * (1-t) + R_e * W_e$$

$$WACC = R_d * 0 * (1-t) + 5% * 100% = 5%$$

	0	1	2	3	4	5
Equipment	150					
Revenue		50	50	50	50	50
Less Cost		15	15	15	15	15
Gross Profit (EBITDA)		35	35	35	35	35
Less Depreciation		150/5 = 30	30	30	30	30
EBIT		5	5	5	5	5
Less 30% tax		30%*5 = 1.5	1.5	1.5	1.5	1.5
Net Income		5-1.5 = 3.5	3.5	3.5	3.5	3.5
Add Depreciation		30	30	30	30	30
Add ATSV						5 - (5-0)*.30 = 3.5
Cash Flow	-150	30+3.5 = 33.5	33.5	33.5	33.5	3.5+30+3.5 = 37
PV of each CF	-150/(1+ 5%)^0 = -150	33.5/1.05^1 = 31.9048	33.5/1.05^2 = 30.3855	33.5/1.05^3 = 28.9386	33.5/1.05^4 = 27.5605	37/1.05^5 = 28.9905

$$NPV = -150 + 31.9 + 30.4 + 27.6 + 29.0 = -31.1$$

Don't take the project. The project will add -31.1 M to the company.

A company is planning to purchase 10M equipment. The machine will increase the revenue by 6M per year but will require a 1M maintenance cost per year. It has a life of 5 years and will be depreciated using straight line method. The machine can be sold for 500k to another company after its useful life. **The company faces 20% tax rate.**

To purchase the machine, the company will issue \$4M worth of 2% bonds and 6M worth of new stocks to purchase the machine. The bond will sell for 900 and will have 5 year maturity. The current price of the company's stock is 100 and the most recent dividend is 2.50, which is expected to grow by 3% every annually.

Find the EVA of buying the machine.

	0	1	2	3	4	5
Equipment	10					

Revenue		6	6	6	6	6
Less Cost		1	1	1	1	1
Gross Profit EBITDA		6-1=5	5	5	5	5
Less Depreciation		10/5=2	2	2	2	2
EBIT		5-2=3	3	3	3	3
Less Interest		0	0	0	0	0
EBT		3	3	3	3	3
Less Tax		20%*3=0.6	.6	.6	.6	.6
Net Income		3-.6=2.4	2.4	2.4	2.4	2.4
Add Depr		2	2	2	2	2
Add ATSV						.5 - .20*(.5 - 0) = 0.4
Cash Flow	-10	2.4+2 = 4.4	4.4	4.4	4.4	2.4+2+.4 = 4.8
PV of each CF	-10/(1.0557)^0 = -10	4.4/(1.0557)^1= 4.1679	4.4/(1.0557)^2 = 3.9479	4.4/(1.0557)^3 = 3.7397	4.4/(1.0557)^4= 3.5423	4.8/(1.0557)^5 = 3.6605

To purchase the machine, the company will issue \$4M worth of 2% bonds and 6M worth of new stocks to purchase the machine. The bond will sell for 900 and will have 5 year maturity. The current price of the company's stock is 100 and the most recent dividend is 2.50, which is expected to grow by 3% annually.

$$W_d = 4/(4+6) = 0.4$$

$$W_e = 6/(4+6) = 0.6$$

Debt

$$P = X/r * (1 - 1/(1+r)^n) + FV/(1+r)^n$$

In excel, PV = -P, PMT = X, FV = 1000, nper = n, rate = r = YTM.

If asked for r, no closed form solution --> excel PMT !!!

$$FV = 1000$$

$$\text{Coupon } X = 2\% * 1000 = 20$$

$$n = 5, P = 900, r = ?$$

$$P = X/r * (1 - 1/(1+r)^n) + FV/(1+r)^n$$

$$900 = 20/r * (1 - 1/(1+r)^5) + 1000/(1+r)^5 \rightarrow r = 4.26\% = R_d$$

Equity:

$$P = 100, D_0 = 2.50, g = 3\%, r = ?$$

$$D_1 = D_0 * (1+g) = 2.50 * 1.03 = 2.575$$

$$P = D_1/(r-g) \rightarrow P(r-g) = D_1 \rightarrow D_1/P = r-g \rightarrow r = D_1/P + g$$

$$r = 2.575/100 + 3\% = 5.57\%$$

$$WACC = R_d * W_d * (1-t) + R_e * W_e$$

$$WACC = 4.26\% * .4 * (1-20\%) + 5.57\% * .6 = 4.71\%$$

$$NPV = -10 + 4.2 + 3.9 + 3.7 + 3.5 + 3.7 = 9.0$$