Special Class on Financial Management for Exam 2020

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Different Cash flows – Do you know them?

- Absolute Cash Flows vs growing cash flows

- Given Cash Flows and Calculated Cashflows

- Probability adjusted cash flow

- Nominal Cash flows vs. Real cash flows /Inflation adjusted

- Free Cash Flows

- Net Cash from different assets - physical assets and financial instruments

Different Cash flows – Do you know them?

- Present Cash Flows vs. Future Cash Flows
- Past cash flows and Future Cashflows
- Marginal Cashflows/Additional Cashflows
- One off cash flows/Lump sum and repetitive cashflows
- Timed cashflows and Perpetual cashflows /Terminal Value
- Discounted Cash flows
- Inflows over outflows

Sources of Cash flows

Revenue over costs/ Contribution Margin

Savings from existing expenses

Dividend

Interest

Sales Price/Capital Gain

Principal Repayment

Disposal Value/ Residual Value

Terminal Value

Value of an Asset = Sum of all discounted net cash (in)flows over its life time

Free Cash Flow

Free cash flow to the firm (FCFF) is defined as the cash flow generated by the firm's operations that is in excess of the capital investment required to sustain the firm's current productive capacity.

FCFF= NI + NCC + Interest (1-t) – FCInv - WCInv

 = EBIT (1-t)+NCC- Gross Capital Expenditure - Investment in WC

Free Cash Flow

Free cash flow to equity (FCFE) is the cash available to stockholders after funding capital requirements and expenses associated with debt financing.

FCFE= NI + NCC – FCInvs – WCINv + Net Borrowing

[when control is presumed]

Free Cash Flow To Firm

FCFF= Revenue – CoGS – Admin Exp-+Non cash expense - Tax – Investment in W/C- Investment in fixed Assets

[For valuation of whole firm]

FCFF = EBIT (1-t)+Depreciation –Investment in W/C - Investment in fixed Assets

[For valuation of whole firm]

Value of a firm

Value of firm = Value of Equity + Value of Preferred Stock + Value of Bond

[Present values of all cash flows from all these sources]

For value of firm, WACC will be used for discounting purpose

However, value of equity can be found from whole firm value = Value of firm – value of preferred stock – value of bond

For value of equity, Cost of equity will be used.

Discount Rate

Discount Rate/ Cost of Capital/ Required rate of Return/ Expected Returns can be found by using:

1. CAPM
2. Multifactor Models
3. Dividend Discount Model
4. Weighted Average Cost of Capital (WACC)
5. Holding period return
6. Required rate may be given.

Discount rate is positively related to Risk/Beta. Higher risk implies higher Beta requires higher return i.e. higher discount rate.

Beta- Measurement of Market Risk

Equity Beta/levered beta=Covariance of market and stocks/variance of stocks

Assets Beta/Unlevered Beta= Be*E/(D+E) + Bd*D/(D+E)

If we assume that debt is risk free, then

Equity beta/[1+(1-tax rate)debt/equity]

Unlevered beta = Levered beta / [1 + (1 - Tax rate) * (Debt / Equity)]

Project Beta   = Re-levered beta

Levered beta = Unlevered beta * [1 + (1 - Tax rate) * (Debt / Equity)]

Pure-play method: Finding a beta of a unlisted company

Find a comparable company

Calculate comparable company's beta

Unlever the comparable company's beta

Lever the beta for the project or unlisted company's capital structure

Practice Problem#1

Knappa Valley Winery's (KVW) most recent FCFF is $5,000,000. KVW's target debt-to-equity ratio is 0.25. The market value of the firm's debt is $10,000,000, and KVW has 2,000,000 shares of common stock outstanding. The firm's tax rate is 40%, the shareholders require a return of 16% on their investment, the firm's before-tax cost of debt is 8%, and the expected long-term growth rate in FCFF is 5%. Calculate the value of the firm and the value per share of the equity.

Solution

Overall cost of capital= $K_e*E/(D+E) + K_d (1-t)*D/(D+E)$

$=16\%*1/1.25+8\%*(1-40\%)*0.25/1.25$

$= 12.8\%+0.96\%$

$= 13.76\%$

$P_0= D_1/(k_e-g) = FCFF_0(1+g)/(wacc-g)$

$\qquad\qquad\qquad = 5(1.05)/(0.1376-.05)$

$\qquad\qquad\qquad = 60$ million

Value of the firm is 60 million.

Value of the equity = Value of the firm – value of the

$\qquad\qquad\qquad\qquad$ bond

$\qquad\qquad = 60$ million – 10 millon

$\qquad\qquad = 50$ millon

Per share value = 50 million/ 2 million

$\qquad\qquad = \$2.50$ per share

Practice Problem#2

The Prentice Paint Company earned a net profit margin of 20% on revenues of $20 million this year. Fixed capital investment was $2 million, and depreciation was $3 million. Working capital investment equals 7.5% of sales every year. **Net income, fixed capital investment, depreciation, interest expense, and sales are expected to grow at 10% per year for the next five years.** After five years, the growth in sales, net income, fixed capital investment, depreciation, and interest expense will decline to a stable 5% per year. The tax rate is 40%, and Prentice has 1 million shares of common stock outstanding and long-term debt paying 12.5% interest trading at its par value of $32 million.

Calculate the value of the firm and its equity using the FCFF model if the WACC is 17% during the high-growth stage and 15% during the stable stage.

Solution

Revenue	20.00
Net profit	4.00
Interest Expense	4.00
After tax Interest Expense	2.40
Depreciation Expense	3.00
Working Capital	1.50
Investment in Fixed Capital	2.00
FCFF0	5.90

	Year 0	Year 1	year 2	year 3	year 4	year 5	Year 6
FCFF with growth	5.90	6.49	7.14	7.85	8.64	9.50	9.98

Terminal value Y5 = FCFF5(1+g)/WACC-g

$$= 9.5(1+0.05)/(0.15-0.05)$$

$$= 9.99/0.1$$

$$= 100 \text{ million}$$

	Year 0	Year 1	year 2	year 3	year 4	year 5
FCFF	5.90	6.49	7.14	7.85	8.64	9.50
Terminal value						100
Total cash Flows		6.49	7.14	7.85	8.64	109.5
Discount factor @17%		0.85	0.73	0.62	0.53	0.46
USD in million		5.55	5.22	4.90	4.61	49.84

Value of the firm = 70 million

Less: value of the bond = 32 million

Value of the equity = 38 million

Number of shares = 1 million

Per share value $38

Practice Problem#3, [CMA-Dec-2017]

A stock market analyst is evaluating the common stock of Keane Investment. She estimates that the company's EBIT for the next year will be $800M. Further she predicts that Keane Investment will require $255M in gross capital expenditure next year. In addition, next year's depreciation will be $75M, and no change in working capital. Free Cash flow is expected to grow at constant annual rate of 6% a year. The company WACC is 9 percent and its cost of equity is 14 percent, before tax cost of debt is 7 percent. The company has $900M of debt, $500 million of preferred stock, and has 200 million outstanding shares of common stock. The firm's tax rate is 40 percent. Using Free cash flow valuation method, what is the predicted price today?

Solution

FCFF0 = EBIT –Tax +NC- Investment in Fixed Assets – Investment in Working Capital

= 800 (1-.40)+75-255-0

= 300 million

V0 = FCFF0(1+g)/(wacc-g)

$\qquad$ = 300/ (0.09-.06)

$\qquad$ = 10,000

Value of the equity = value of the firm- value of the preferred stock- value of the bond

$\qquad$ = 10000- 500 – 900

$\qquad$ = 86,00 million

Per share equity = 8600 million/ 200 million

$\qquad$ = $43 per share

Practice Problem#4[CMA Dec-2018]

Karol Kar, Inc. is considering the acquisition of North Star, Inc. North Star is expected to provide Karol Kar with operating cash flows of $14, $19, $20, and $10 million over next four years. In addition, the terminal value of all remaining cash flows at the end of Year 4 is estimated at $18 million. The merger will cost Karol $41 million which is due now in cash in a single lump sum. If the value of the merger is estimated at $6 million per share and Karol Kar has 2 million shares outstanding, what equity discount rate must the firm be using to value this acquisition

NPV = CF1/(1+r)1+ CF2 /(1+r)^2+…… - 41

12= CF1/(1+r)1+ CF2 /(1+r)^2+…… - 41

53 = CF1/(1+r)1+ CF2 /(1+r)^2+……

53 = 14/(1+r)+19/(1+r)^2+20/ (1+r)^3+28/(1+r)^4

Guess Rate = 14+19+20+28= 81/53 = 1.54 -1 = 0.54/4= 14%

Take 5% more to calculate first NPV

Year	CF	at 18%	at 16%
0	(53.00)	(53.00)	(53.00)
1	14.00	11.86	12.07
2	19.00	13.65	14.12
3	20.00	12.17	12.81
4	29.00	14.96	16.02
		(0.36)	2.02
			17.70%

Equity discount rate = 17.71% [By interpolation]

Practice Problem#5 [CMA Dec-2018]

Trent Transport, a U.S. based Company, is considering expanding its operations into a foreign country. The required investment at now is $10 million. The firm forecasts total cash inflows of $4 million per year for two years, $6million for next two years, and then a possible terminal value of $8 million. In addition, due to political risk factors, Trent believes that there is a 50% chance that the gross terminal value will be only $2 million and that there is 50% chance that it will be $8 million. However, the government of the host country will block 20% of all cash flows. Thus cash flows that can be repatriated are 80 percent of those projected. Trent's cost of capital is 15 percent, but it adds one percentage point to all foreign projects to account for exchange rate risk. What is circumstances, what is the project's NVP (Value?)

The Wyatt Inc. has the following three divisions. All relevant information for the divisions has been given below:

Division	Asset Beta	Net Period's Expected Cash Flow ($m)	Expected Growth Rate
Oil Exploration	1.40	450	4.00%
Oil Refining	1.1	525	2.5%
Gas & Governance Stores	0.80	600	3.00%

The risk free rate of interest is 3% and the market risk premium is 5% (i.e. market return is 8%).

Required:

Value of each division and overall value of the Wyatt.

Solution

Required return = RF+Beta(RM-RF)

Oil Exploration = 3% +1.40*5% = 10%

Oil Refining = 3% +1.1*5%= 8.5%

Gas and Gov = 3%+.8*5% = 7%

Value exp = 450 / (0.1 − 0.04) = $7500

Value Ref = 525/ (0.085-0.025) = $8750

Value gov = 600 / (0.07-0.03)= $15000

Total Value = 7500+8750+15000 = $31,250

Firm beta = 1.40* 7500/31,250 + 1.10* 8750/31,250 + 0.80* 15000/31,250

=1.028

Firm Return = 10%* 7500/31,250 + 8.50%* 8750/31,250 + 7%* 15000/31,250

= 8.14%

Nielson Motors Ltd is a newly public firm 25 million shares outstanding. You are doing a valuation analysis of Nielson and you estimate its free cash flow in the coming year to be $40 million. You expect the firm's free cash flow to grow by 4% per year in subsequent years. Because the firm has only been listed on stock exchange for a short time, you do not have an accurate assessment of Nielson's equity beta. However, you do have the following data for another firm in the same industry:

Equity Beta	Debt Beta	Debt-Equity Ratio
1.8	0.40	1.5

Nielson has a much lower debt-equity ratio of 0.50, which is expected to remain stable, and Nielson's debt is risk free. Neilson corporate tax rate is 40%, the risk free rate is 5%, and the expected return on market portfolio is 10%. You are required to calculate:

Nielson's equity beta, cost of equity and share price

Unleverd beta = Equity beta / [1+D/E(1-t)]
                          = 1.8 / [1+ (1.5/1*0.6)]
                          = 0.95

Relevered beta = 0.95 * [1+ (0.5/1)*0.6)]
                          = 0.73

Cost of equity = RF+Beta (RM-RF)
                          = 5%+ .73 (01-.05)
                          = 8.65%

Value of the Neilson = 40 /0.0865- 0.04
                          = 860 million
Share price   = 860 /25
                          = $34.40

Practice Problem#8, CMA April-19

Bessey Aviation is considering leasing or purchasing a small aircraft to transport executives between manufacturing facilities and the main administrative headquarters. The firm is in the 40 percent tax bracket and it after tax cost of debt is 7 percent. The estimated after cash flows for the lease and purchasing alternatives are given below

End of year	Cash flows (after tax)	
	Lease	Purchase
1	-64,329	-68,454
2	-64,329	-59,110
3	-64,329	-63,596
4	-64,329	-66,633
5	-64,329	30,056

Calculate the present value of the after tax cash flows using after tax cost of debt.

Which alternative you recommend.

A project under consideration costs Tk.750,000, has a five year life, and has no salvage value. Depreciation is straight-line to zero. The required return is 17 percent, and the tax rate is 34 percent. Sales are projected at 500 units per year. Price per unit is Tk.2500, variable cost per unit is Tk.1500 and fixed costs are Tk.2,00,000 per year. Suppose you think that the unit sales, price and variable costs and fixed costs projections given here are accurate to within 5 percent.

What are the upper and lower bounds for these projections? What is the base case of NPV? What are the worst case scenario NPVs

Q&A