

AFM Booster Masterclass

Chapter 2 - Business Valuation

Question 1: RTP May 2023

Excellent Ltd., reported a profit of ₹ 154 lakhs after 30% tax for the financial year 2019-20. An analysis of the accounts revealed that there is an extraordinary loss of ₹ 20 lakhs and the income included extraordinary items of ₹ 16 lakhs. The existing operations, except for the extraordinary items, are expected to continue in the future. In addition, the results of the launch of a new product are expected to be as follows:

₹ in lakhs

Sales	140
Material costs	40
Labour costs	24
Fixed costs	20

You are required to:

- (i) Calculate the value of the business, given that the capitalization rate is 14%.
- (ii) Determine the market price per equity share, with Excellent Ltd.'s share capital being 2,00,000 at 13% preference shares of ₹ 100 each and 100,00,000 equity shares of ₹ 10 each and the P/E ratio being 12 times. (Ignoring Corporate Dividend Tax).

Solution 1:**(i) Computation of Business Value**

		(₹ Lakhs)
Profit before tax 1541-0.30		220
Less: Extraordinary income		-16
Add: Extraordinary losses		20
		224
Profit from new product	(₹ Lakhs)	
Sales	140	
Less: Material costs 40		
Labour costs 24		
Fixed costs 20	-84	56
		280
Less: Taxes @30%		84
Future Maintainable Profit after taxes		196
Relevant Capitalisation Factor		0.14
Value of Business (₹ 196/0.14)		1400

(ii) Determination of Market Price of Equity Share

Future maintainable profits (After Tax)	₹ 1,96,00,000
Less: Preference share dividends 2,00,000 shares of ₹ 100 @ 13%	₹ 26,00,000
Earnings available for Equity Shareholders	₹ 1,70,00,000
No. of Equity Shares	1,00,00,000
Earning per share = $\frac{₹ 1,70,00,000}{1,00,00,000}$	₹ 1.70
PE ratio	12
Market price per share	₹ 20.40

Question 2: MTP 1 May 2023 (March)

Herbal Box is a small but profitable producer of beauty cosmetics using the plant, Aloe Vera. Though it is not a high-tech business, yet Herbal's earnings have averaged around ₹ 18.5 lakhs after tax, mainly on the strength of its patented beauty cream to remove the pimples.

The patent has nine years to run, and Herbal Box has been offered ₹ 50 lakhs for the patent rights. Herbal's assets include ₹ 50 lakhs of property, plant, and equipment, and ₹ 25 lakhs of working capital. However, the

patent is not shown on the books of Herbal Box. Assuming Herbal's cost of capital being 14 percent, calculate its Economic Value Added (EVA).

Solution 2:

EVA = Income Earned – (Cost of Capital x Total Investment)

Total Investments

	Amount (₹ in Lakhs)
Working Capital	25.00
Property, Plant & Equipments	50.00
Patent Rights	50.00
Total	125.00

EVA = Profit Earned – WACC x Invested Capital
 = ₹ 18.5 Lakhs – 14% x ₹ 125 Lakhs
 = ₹ 1.00 Lakhs

Question 3: RTP Nov 2023

BRS Inc deals in computer and IT hardwares and peripherals. The expected revenue for the next 8 years is as follows:

Years	Sales Revenue (\$ Million)
1	8
2	10
3	15
4	22
5	30
6	26
7	23
8	20

Summarized financial position as on 31 March 2012 was as follows:
 \$ Million

Liabilities	Amount	Assets	Amount
Equity Stocks	12	Fixed Assets (Net)	17
12% Bonds	8	Current Assets	3
	20		20

Additional Information:

(a) Its variable expenses is 40% of sales revenue and fixed operating expenses (cash) are estimated to be as follows:

Period	Amount (\$ Million)
1- 4 years	1.6
5-8 years	2

(b) An additional advertisement and sales promotion campaign shall be launched requiring expenditure as per following details:

Period	Amount (\$ Million)
1 year	0.50
2-3 years	1.50
4-6 years	3.00
7-8 years	1.00

(c) Fixed assets are subject to depreciation at 15% as per WDV method.

(d) The company has planned additional capital expenditures (in the beginning of each year) for the coming 8 years as follows:

Period	Amount (\$ Million)
1	0.50
2	0.80
3	2.00
4	2.50

5	3.50
6	2.50
7	1.50
8	1.00

- (e) Investment in Working Capital is estimated to be 20% of Revenue.
 (f) Applicable tax rate for the company is 30%.
 (g) Cost of Equity is estimated to be 16%.
 (h) The Free Cash Flow of the firm is expected to grow at 5% per annum after 8 years. With above information you are required to determine the:
 (i) Value of Firm
 (ii) Value of Equity

Notes: (i) PVF Table @ 13%

Year	1	2	3	4	5	6	7	8
PVF	0.885	0.783	0.693	0.613	0.543	0.480	0.425	0.376

- (ii) Round off calculations upto 2 decimal points.

Solution 3:

(a) Determination of Weighted Average Cost of Capital

Sources of funds	Cost (%)	Proportions	Weights	Weighted Cost
Equity Stock	16	12/20	0.60	9.60
12% Bonds	12% (1-0.30) = 8.40	8/20	0.40	3.36
				12.96 say 13

(b) Schedule of Depreciation \$ Million

Year	Opening Balance of Fixed Assets	Addition during the year	Total	Depreciation @ 15%
1	17	0.5	17.5	2.63
2	14.87	0.8	15.7	2.35
3	13.32	2	15.3	2.3
4	13.02	2.5	15.5	2.33
5	13.19	3.5	16.7	2.5
6	14.19	2.5	16.7	2.5
7	14.19	1.5	15.7	2.35
8	13.34	1	14.3	2.15

(c) Determination of Investment \$ Million

Year	Investment Required			Existing Investment in CA	Additional Investment required
	For Capital Expenditure	CA (20% of Revenue)	Total		
1	0.50	1.60	2.10	3.00	0.00
2	0.80	2.00	2.80	2.50*	0.30
3	2.00	3.00	5.00	2.00**	3.00
4	2.50	4.40	6.90	3.00	3.90
5	3.50	6.00	9.50	4.40	5.10
6	2.50	5.20	7.70	6.00	1.70
7	1.50	4.60	6.10	5.20	0.90
8	1.00	4.00	5.00	4.60	0.40

* Balance of CA in Year 1 (\$3 Million) – Capital Expenditure in Year 1(\$ 0.50 Million)

** Similarly balance of CA in Year 2 (\$2.80) – Capital Expenditure in Year 2(\$ 0.80 Million)

(d) Determination of Present Value of Cash Inflows \$ Million

Particulars	Years							
	1	2	3	4	5	6	7	8
Revenue (A)	8	10	15	22	30	26	23	20
Less: Expenses								
Variable Costs	3.2	4	6	8.8	12	10	9.2	8

Fixed cash operating cost	1.6	1.6	1.6	1.6	2	2	2	2
Advertisement Cost	0.5	1.5	1.5	3	3	3	1	1
Depreciation	2.63	2.35	2.3	2.33	2.5	2.5	2.35	2.15
Total Expenses (B)	7.93	9.45	11.4	15.7	19.5	18	14.6	13.2
EBIT (C) = (A) - (B)	0.07	0.55	3.6	6.27	10.5	8.1	8.45	6.85
Less: Taxes@30% (D)	0.02	0.16	1.08	1.88	3.15	2.4	2.53	2.06
NOPAT (E) = (C) - (D)	0.05	0.39	2.52	4.39	7.35	5.7	5.92	4.79
Gross Cash Flow (F) = (E) + Dep	2.68	2.74	4.82	6.72	9.85	8.2	8.27	6.94
Less: Investment in Capital Assets plus Current Assets (G)	0	0.3	3	3.9	5.1	1.7	0.9	0.4
Free Cash Flow (H) = (F) - (G)	2.68	2.44	1.82	2.82	4.75	6.5	7.37	6.54
PVF@13% (I)	0.89	0.78	0.69	0.61	0.54	0.5	0.43	0.38
PV (H)(I)	2.37	1.91	1.26	1.73	2.58	3.1	3.13	2.46

Total present value = \$ 18.549 million

(e) **Determination of Present Value of Continuing Value (CV)**

$$CV = \frac{FCF_9}{k-g} = \frac{\$6.54 \text{ million} (1.05)}{0.13 - 0.05} = \frac{\$6.867 \text{ million}}{0.08} = \$85.84 \text{ million}$$

Present Value of Continuing Value (CV) = \$85.84 million $\times PVF_{12\%,8} = \$85.96875 \text{ million} \times 0.376 = \32.27 million

(i) **Value of Firm**

Present Value of cash flow during explicit period
Present Value of Continuing Value
Total Value

\$ Million

18.55
32.27
50.82

(ii) **Value of Equity**

Total Value of Firm
Less: Value of Debt
Value of Equity

\$ Million

50.82
8.00
42.82

Question 4: MTP 1 Nov 2023 (September)

Compute EVA of X Ltd. with the following information:

Profit and Loss Statement		Balance Sheet	
Revenue	1500	PPE	1500
Direct Costs	-585	Current Assets	450
Selling, General & Admin. Exp. (SGA)	-300		1950
EBIT	615	Equity	1050
Interest	-15	Reserves	150
EBT	600	Non-Current Borrowings	150
Tax Expense @30%	-180	Current Liabilities & Provisions	600
EAT	420		1950

Assume Bad Debts provision of ₹ 30 Lac is included in the SGA, and same amount is reduced from the trade receivables in current assets.

Also assume that the pre-tax Cost of Debt is 12% and Equity shareholder's expected return is 10%.

Note: Make calculation in ₹ lac and round off up to 2 decimal points.

Solution 4:

Working Notes:

(1) Computation of NOPAT

EBIT	615.00
Less: Taxes	-184.50
Add: Non-Cash Expenses	30.00
NOPAT	460.50

(2) Computation of Invested Capital:

Total Assets	1950
Less: Non Interest bearing liabilities	-600
	1350
Add: Non Cash adjustment	30
Invested Capital	1380

Note: It is assumed that the current liabilities also include the 180 of tax liability.

(3) Computation the WACC

$$\begin{aligned} \text{WACC} &= \text{Cost of equity} + \text{Cost of debt} \\ &= (1200/1350 \times 10\%) + [150/1350 \times 12\% (1 - 0.30)] \\ &= 8.89\% + 0.933\% = 9.82\% \end{aligned}$$

(4) Capital Charge = Invested Capital * WACC = ₹ 1380 lac * 9.82% = ₹ 135.516 lac

The formula for computing Economic Value Added:

EVA = Adjusted NOPAT – Capital Charge.

Accordingly, EVA of X Ltd. is

$$= ₹ 460.50 \text{ lac} - ₹ 135.52 \text{ lac} = ₹ 324.98 \text{ lac}$$

Question 5: MTP 2 Nov 2023 (October)

AB Ltd., is planning to acquire and absorb the running business of XY Ltd. The valuation is to be based on the recommendation of merchant bankers and the consideration is to be discharged in the form of equity shares to be issued by AB Ltd. As on 31.3.2020, the paid up capital of AB Ltd. consists of 80 lakhs shares of ₹ 10 each. The highest and the lowest market quotation per share during the last 6 months were ₹ 570 and ₹ 430. For the purpose of the exchange, the price per share is to be reckoned as the average of the highest and lowest market price during the last 6 months ended on 31.3.2020.

XY Ltd.'s Balance Sheet as at 31.3.2020 is summarised below:

	₹ lakhs
Sources	
Share Capital	
20 lakhs equity shares of ₹10 each fully paid	200
10 lakhs equity shares of ₹10 each, ₹5 paid	50
Loans	100
Total	350
Uses	
Fixed Assets (Net)	150
Net Current Assets	200
	350

An independent firm of merchant bankers engaged for the negotiation, have produced the following estimates of cash flows from the business of XY Ltd.:

Year ended	By way of	₹ lakhs
31.3.21	after tax earnings for equity	105
31.3.22	do	120
31.3.23	Do	125
31.3.24	Do	120
31.3.25	Do	100
	Terminal Value estimate	200

It is the recommendation of the merchant banker that the business of XY Ltd. may be valued on the basis of the average of (i) Aggregate of discounted cash flows at 8% and (ii) Net assets value. Present value factors at 8% for years

1-5: 0.93 0.86 0.79 0.74 0.68

You are required to:

- (i) Calculate the total value of the business of XY Ltd.
- (ii) The number of shares to be issued by AB Ltd.; and
- (iii) The basis of allocation of the shares among the shareholders of XY Ltd.

Solution 5:

Price/share of AB Ltd. for determination of number of shares to be issued

$$= (\text{₹ } 570 + \text{₹ } 430)/2 = \text{₹ } 500$$

Value of XY Ltd based on future cash flow capitalization (105x0.93)+(120x0.86)+(125x0.79)+(120x0.74)x(300x0.68)	₹ lakhs	592.40
Value of XY Ltd based on net assets	₹ lakhs	250.00
Average value (592.40+250)/2		421.20
No. of shares in AB Ltd to be issued ₹ 4,21,20,000/500	Nos.	84240
Basis of allocation of shares		
Fully paid equivalent shares in XY Ltd. (20+5) lakhs		2500000
Distribution to fully paid shareholders 84240x20/25		67392
Distribution to partly paid shareholders 84240-67392		16848

Question 6: Nov 2023

The following information is given for three companies that are identical in size, activities and operations, except for their capital structure:

Particulars	A	B	C
Total Capital Invested	10,00,000	10,00,000	10,00,000
Debt/ Assets Ratio	0.75	0.60	0.25
Shares Outstanding	8,960	13,300	30,100
Pre-tax cost of debt	12%	10%	14%
Operating Income (EBIT)	2,50,000	2,50,000	2,50,000
Beta Values	1.25	1.00	0.875

The tax rate is uniform 30% in all cases. Risk free interest rate is 6% and Market Risk premium is 16%. You are required to compute:

- (i) Weighted average cost of capital for each company.
- (ii) Economic Value Added (EVA) for each company.
- (iii) Based on EVA which company would be considered for best investment? Give reasons.
- (iv) If the industry PE ratio is 12x, estimate the market price and Market Capitalization for each of the companies.

Solution 6:

- (i) Weighted Average Cost of Capital

- (1) Cost of Debt

	A	B	C
Pre-tax Cost of debt	12%	10%	14%
Post-tax Cost of debt	8.40%	7.00%	9.80%

- (2) Cost of Equity

	Rf	Beta	ke
A	6%	1.25	6% + 1.25 x 16% = 26%
B	6%	1.00	6% + 1.00 x 16% = 22%
C	6%	0.875	6% + 0.875 x 16% = 20%

WACC

A:	(8.40 x 0.75) + (26 x 0.25)	=	12.80%
B:	(7.00 x 0.60) + (22 x 0.40)	=	13.00%
C:	(9.80 x 0.25) + (20 x 0.75)	=	17.45%

- (ii) EVA

	A	B	C
WACC	12.80%	13.00%	17.45%

EVA [EBIT (1-T)-(WACC x Invested Capital)]	47,000	45,000	500
--	--------	--------	-----

(iii) Based on EVA Company A would be best for investment.

(iv) Market Price and Market Capitalization

	A	B	C
EBIT	₹ 2,50,000	₹ 2,50,000	₹ 2,50,000
Less: Interest on Debt	90,000	60,000	35,000
EBT	₹ 1,60,000	₹ 1,90,000	₹ 2,15,000
Tax @ 30%	₹ 48,000	₹ 57,000	₹ 64,500
EAT	₹ 1,12,000	₹ 1,33,000	₹ 1,50,500
No. Shares O/S	8,960	13,300	30,100
EPS	₹ 12.50	₹ 10.00	₹ 5.00
PE Multiple	12	12	12
Market Price Per Share	₹ 150	₹ 120	₹ 60
Market Capitalization	₹ 13,44,000	₹ 15,96,000	₹ 18,06,000

Question 7: MTP 1 May 2024 (March)

Following information is given in respect of Alpha Ltd., which is expected to grow at a rate of 20% p.a. for the next three years, after which the growth rate will stabilize at 8% p.a. normal level, in perpetuity.

	For the year ended March 31, 2023
Revenues	₹ 15,000 Crores
Cost of Goods Sold (COGS)	₹ 6,000 Crores
Operating Expenses	₹ 4,500 Crores
Capital Expenditure	₹ 1,500 Crores
Depreciation (included in Operating Expenses)	₹ 1,200 Crores

During a high growth period, Revenues & Earnings before Interest & Tax (EBIT) will grow at 20% p.a. and capital expenditure net of depreciation will grow at 15% p.a.

From year 4 onwards, i.e. normal growth period revenues and EBIT will grow at 8% p.a. and incremental capital expenditure will be offset by the depreciation. During both high growth & normal growth period, net working capital requirement will be 25% of revenues.

Out of total capital, 60% constitute Equity and rest is Debt. The cost of equity is 17.53% and pre-tax cost of debt is 16%.

Corporate Income Tax rate is 30%.

Required:

Estimate the value of Alpha Ltd. using Free Cash Flows to the Firm (FCFF).

The PVIF @ 15 % for the three years are as below:

Year	t1	t2	t3
PVIF	0.8696	0.7561	0.6575

Note: Carry out calculation in ₹ Crore and round off figures upto two decimal points.

Solution 7:

Determination of forecasted Free Cash Flow to the Firm (FCFF)

	(₹ in crores)			
	Yr. 1	Yr. 2	Yr. 3	Terminal Year
Revenue	18000.00	21600.00	25920.00	27993.60
COGS	7200.00	8640.00	10368.00	11197.44
Operating Expenses	3960.00*	4752.00	5702.40	6158.59
Depreciation	1440	1728	2073.60	2239.49
EBIT	5400	6480	7776	8398.08
Tax @30%	1620	1944	2332.80	2519.42
EAT	3780	4536	5443.20	5878.66
Capital Exp. – Dep.	345	396.76	456.26	-
Δ Working Capital	750	900	1080	518.40
Free Cash Flow (FCF)	2685	3239.24	3906.94	5360.26

* Excluding Depreciation.

Calculation of WACC

$$= 60\% \times 17.53\% + 40\% \times 16\% (1-0.30) = 15\%$$

Present Value (PV) of FCFF during the explicit forecast period is:

FCFF (₹ in crores)	PVF @ 15%	PV (₹ in crores)
2685.00	0.8696	2334.88
3239.24	0.7561	2449.19
3906.94	0.6575	2568.81
		7352.88

PV of the terminal, value is:

$$\frac{5360.26}{0.15 - 0.08} \times \frac{1}{(1.15)^3} = ₹ 76575.14 \text{ Crore} \times 0.6575 = ₹ 50348.16 \text{ Crore}$$

The value of the firm is :

$$₹ 7352.88 \text{ Crores} + ₹ 50348.16 \text{ Crores} = ₹ 57701.04 \text{ Crores}$$

Question 8: MTP 1 Nov 2024 (September)

There is a privately held company X Pvt. Ltd that is operating into the retail space, and is now scouting for angel investors. The unleveraged beta based on the industry in which it operates is 1.8, and the average debt to equity ratio of X Pvt. Ltd. is hovering at 40:60. The rate of return provided by risk free GOI Bonds is 5%. The rate of market return for the industry is 11%. The FCFs for the next 3 years are as follows:

	Year 1	Year 2	Year 3
Free Cash Flows (₹ Crore)	10	12	15

The pre-tax cost of debt is 12%. Assume a tax regime of 30%.

Determine the potential value to be placed for X Pvt. Ltd, based on above-mentioned FCFs.

Note: Use PVF and round off calculations upto 3 decimal points.

Solution 8:

To compute the value of A Ltd. first, we shall calculate WACC of the company. Since its share is not trading in the market, we shall use proxy beta to calculate the cost of equity. Since the unlevered beta of the industry is 1.8 the levered beta of the company will be:

$$1.8[1+(1-0.3)*40/60] = 2.64$$

The Cost of equity in accordance with CAPM = $r(f) + \beta(R_m - R_f)$

$$= 5\% + 2.64(11\% - 5\%) = 20.84\%$$

The WACC = Cost of Equity + Cost of Debt

$$= 20.84(60/100) + 12.0(1-0.3)(40/100) = 15.864$$

Finally, the free cash flows can be discounted at the WACC obtained above as under –

	Year 1	Year 2	Year 3
Free Cash Flows	10	12	15
Discount factor	0.863	0.745	0.643
PVs of cash flows	8.63	8.94	9.645
Value of X Pvt. Ltd. (₹ Crore)			27.215

Question 9: MTP 1 Nov 2024 (September)

The following data pertains to HPS Inc. engaged in software consultancy business as on 31 December 2023:

	(\$ Million)
Income from consultancy	1870.00
EBIT	360.00
Less: Interest on Loan	36.00
EBT	324.00
Tax @ 35%	113.40
	210.60

Balance Sheet

(\$ Million)

Liabilities	Amount	Assets	Amount
-------------	--------	--------	--------

Equity Stock (20 million share @ \$ 10 each)	200	Land and Building Computers & Softwares	400 590
Reserves & Surplus	650		
Loans	360	Current Assets:	
Current Liabilities	360	Debtors	300
		Bank	200
	1570	Cash	80
			580 1570

With the above information and following assumption you are required to compute

(i) Economic Value Added

(ii) Market Value Added.

Assuming that:

(1) WACC is 12%.

(2) The share of company currently quoted at \$ 50 each.

Solution 9:

(i) Determination of Economic Value Added (EVA)

	\$ Million
EBIT	360.00
Less: Taxes @ 35%	126.00
Net Operating Profit after Tax	234.00
Less: Cost of Capital Employed [W. No.1]	145.20
Economic Value Added	88.80

(ii) Determination of Market Value Added (MVA)

	\$ Million
Market value of Equity Stock [W. No. 2]	1000
Equity Fund [W. No. 3]	850
Market Value Added	150

Working Notes:

- (1) Total Capital Employed
- | | |
|----------------------|------------------------|
| Equity Stock | \$ 200 Million |
| Reserves and Surplus | \$ 650 Million |
| Loan | \$ 360 Million |
| | <u>\$ 1210 Million</u> |
- WACC 12%
- Cost of Capital employed \$ 1210 Million x 12% \$ 145.20 Million
- (2) Market Price per equity share (A) \$ 50
- No. of equity share outstanding (B) 20 Million
- Market value of equity stock (A) x (B) \$ 1000 Million
- (3) Equity Fund
- | | |
|--------------------|-----------------------|
| Equity Stock | \$ 200 Million |
| Reserves & Surplus | \$ 650 Million |
| | <u>\$ 850 Million</u> |

Question 10: Nov 2024

Economic Value Added (EVA) of ABC Ltd was ₹ 31,10,000.

Following is the capital structure of ABC Ltd. at the end of current financial year:

Equity (Share Capital + Reserves & Surplus)	₹170 lakhs
Debt (Coupon Rate 10%)	₹ 80 lakhs
Invested Capital	₹250 lakhs

Following data is given to estimate the cost of equity capital :

Beta of ABC Ltd.	0.90
Risk-free rate (i.e. current yield on Govt. Bonds)	8%
Average market risk premium	10%

Economic Value Added (EVA) of ABC Ltd was ₹31,10,000.

The applicable corporate income tax rate is 30%.

You are required to calculate the Profit After Tax of ABC Ltd.