METHOD 3: ADJUSTED PRESENT VALUE APPROACH

Adjusted Present Value = Unlevered firm value + Present value of tax benefits – Expected bankruptcy costs

Where:

- Unlevered firm value =Unlevered value of the operating assets + Cash and marketable securities
- Unlevered value of the operating assets = PV of FCFF discounted at unlevered cost of equity
- Present value of tax benefits = Tax rate × Market value of debt (Assuming debt to be perpetual)
- Expected bankruptcy costs = (Probability of bankruptcy) × (PV of bankruptcy cost)
- PV of bankruptcy cost = Difference between the value of a firm as a going concern and the distress sale value.

Case Study 7: XYZ Pharmaceuticals - Distressed Firm (APV Approach)

XYZ Pharmaceuticals is a distressed pharmaceutical company. The firm has been facing financial difficulties due to multiple factors, including intense competition, regulatory challenges, and a decline in market share. XYZ Pharmaceuticals has a high debt burden resulting from an unsuccessful product launch and increasing research and development costs.

The firms latest financial statements are shown in Exhibit 1 and Exhibit 2 below:

Exhibit 1: Income Statement for the year just ended (Rs. in Crores)	
Revenue	12000
EBIT (5%)	600
Int expense (10%)	700
PBT	-100
Tax (@25%)	0
PAT	-100

Exhibit 2: Balance Sheet at T=0 (Rs. in Crores)	
Uses of fund	
Fixed assets	10000
Current assets (Including Cash and Marketable securities of 1000)	2000
Less: Current liability	2500
Net Current Assets	-500
Invested capital	**9500**
Source of fund	

10% Long term debt	7000
Equity share capital(Rs. 10 Face Value)	3000
P&L A/c Debit Balance	-500
Net worth	2500
Invested capital	**9500**

Other relevant information is given in **Exhibit 3**

Exhibit 3: Other Information(Rs. in Crores)	
Market value of equity	2400
Market value of debt	5000
Tax rate	25%
Rf	6%
Market Risk Premium	5%
Debt Rating	B

Based on bond ratings, **Exhibit 4** shows the default risk premium over and above Rf over a 5 years period.

Exhibit 4

Rating	Default risk premium
AAA	1
AA	2
A	3
BBB	4
BB	6
B	7
CCC	10
CC	14
C	20

The conditional probability of distress (i.e. probability of distress in a year given no distress in the previous year) is given below:

Years	1	2	3	4	5
Conditional PD	20%	15%	10%	5%	5%

You are a research analyst and specialized in the valuation of distressed companies. A client of yours is contemplating buying the stock of the company as it has falling by more than 50% in the last two weeks. Hence he has approached you for advise. You recently read Aswath Damodaran's famous book "**Dark side of valuation**" and decided to use the method of "Adjusted present value (APV)".

For the purpose of estimated going concern value, use the following-

- Take a 5 year horizon
- Revenue is expected to fall by 5% p.a. for the next 2 years, stay flat for the 3rd year, grow by 3% for the 4th year and then stabilize at 7% p.a. from the 5th years onward forever.
- Operating margin will fall to 3% for the 1st 2 years, 4% for the 3rd year, 5% for the 4th year and 6% from the 5th year onwards forever.
- Tax rate 25%
- Re-investment rate as a percentage of NOPAT would be -10% for year 1, -5% for year 2, flat year 3, 2% year 4 and 4% year 5 onwards forever
- Debt equity ratio (Market value based) is forecasted to be 2 for year 1(rating B), 1.5 year 2(rating BB), 1.2 year 3(rating BBB), 1.1 year 4 (rating BBB) and stabilize at 1(rating A) form the 5th year onwards.
- There are three comparable firms to XYZ Pharmaceuticals which are declining but not under distress-

Firms	Beta	D/E
A	1.6	1.5
B	1.9	2
C	0.9	0.2

  Unlevered beta may be taken as an average of the above

- Beyond year 5, FCFF will grow at 7% p.a. forever

For the purpose of distress sale value, we can take that to be 20% of invested capital.

Calculate the per share value of equity, **compare** that with the existing market price and advise.

ANSWER:

Step 1: Going concern value on an enterprise value basis

Particulars	1	2	3	4	5
Revenue g	-5%	-5%	0	3%	7%
OPM	3%	3%	4%	5%	6%
Revenue	11,400	10,830	10,830	11,155	11,936
EBIT	342	325	433	558	716
NOPAT	257	244	325	418	537
Reinvestment rate	-10%	-5%	0	2%	4%
FCFF	282.15	255.86	324.90	409.94	515.62
Debt equity ratio	2	1.5	1.2	1.1	1
Levered beta	1.913	1.62605	1.45388	1.39649	1.3391
Ke	0.15565	0.1413025	0.132694	0.1298245	0.126955
Rating	B	BB	BBB	BBB	A
Default risk premium	7%	6%	4%	4%	3%
Pre taxKd	13%	12%	10%	10%	9%
Post tax Kd	9.75%	9.00%	7.50%	7.50%	6.75%
Wd	0.67	0.60	0.55	0.52	0.50
We	0.33	0.40	0.45	0.48	0.50
Kc	11.69%	11.05%	10.12%	10.11%	9.72%
PV of CF	252.62	206.28	237.87	272.57	312.46
Terminal Value					20263.26
PV of terminal value					12279.27
Going concern value	**13561.08**				

Step 2: Distress value on an enterprise value basis

Book value of invested capital	9500
Distress sale value (20%)	1900

Step 3: PV of bankruptcy cost = Difference between the value of a firm as a going concern and the distress sale value.

= 13561.08 – 1900

= 11661.08

Step 4: Probability of bankruptcy

Conditional PD	20%	15%	10%	5%	5%
Conditional Probability of survival	80%	85%	90%	95%	95%
Cumulative prob of survival	55.23%				
Cumulative Prob of distress	44.77%				

Step 5: Expected bankruptcy cost = (Probability of bankruptcy) × (PV of bankruptcy cost)
= 44.77% × 11661.08
= 5220.67

Step 6: Present value of tax benefits = Tax rate × Market value of debt (Assuming debt to be perpetual)
= 25% × 5000
= 1250

Step 7: Unlevered cost of equity

Firms	Levered Beta	D/E	Post tax debt equity ratio	Unlevered beta
A	1.6	1.5	1.125	0.7529
B	1.9	2	1.5	0.76
C	0.9	0.2	0.15	0.7826
Average i.e. beta unlevered				**0.7652**
Rf				6%
Rm - Rf				5%
Unlevered cost of equity				**9.826%**

Step 8: Unlevered firm value = PV of FCFF discounted at unlevered cost of equity + Cash and marketable securities

Particulars	**1**	**2**	**3**	**4**	**5**
FCFF	282.15	255.86	324.90	409.94	515.62
PV of FCFF @ 9.826%	256.91	212.13	245.26	281.77	322.70
Terminal Value					19522.77
PV of terminal value					12218.44
Unlevered value of operating assets	**13537.21**				
Add: Cash and marketable securities	**1000**				
Unlevered firm value	**14537.21**				

Step 9: Adjusted Present Value = Unlevered firm value + Present value of tax benefits – Expected bankruptcy costs
= 14537.21 + 1250 – 5220.67
= 10566.54

Step 10: Value of equity = Adjusted Present Value – Market value of debt

Unlevered value of operating assets	10566.54
Less: Market value of debt	(5000)
Value of equity	5566.54
Number of equity shares	300
Value per share	18.56
Market price of the share	8

Comment	**Underpriced**
Advise	**Buy/Go long**