



N P T E L O N L I N E C E R T I F I C A T I O N C O U R S E S

MERGERS, ACQUISITIONS AND CORPORATE RESTRUCTURING

PROF. CHANDRA SEKHAR MISHRA

Vinod Gupta School of Management
Indian Institute of Technology Kharagpur

LECTURE: 11

TITLE: Introduction to Valuation in M&A

oncepts covered



- Introduction to Valuation
- Select rules for Valuation
- Valuation in case of M&A
- Different methods of Valuation
- Valuation Multiples



Keywords



- Valuation
- Asset based valuation
- Free cash flow
- Dividend discounting
- Relative valuation

Valuation of Company



- Valuation is future oriented: fundamentally, intrinsic value of any asset is the present value of future benefits. Investors invest today keeping future in mind.
- Value is not same as price

Select Rules for Valuation*

- Rule # 1: One has to think like an Investor while finding intrinsic value. Information is the key. One has to know something about the target that the market does not know.
 - *“Anyone not aware of the fool in the market probably is the fool in the market” - Warren Buffet (quoted in Michael Lewis, Liar’s Poker, New York: Norton. 1989, p.35)*
- Rule # 2: It is difficult to observe intrinsic value. However, one can estimate it.
 - Concept of Enterprise value vs. Equity value

**Adapted from Bruner (2004)*

Select Rules for Valuation, contd..

- Rule # 3: If price and intrinsic value differ, there is an opportunity to create value.
- Rule # 4: There are several methods of valuation. Choosing the right one is the most difficult task.
- Rule # 5: One has to be careful to suggest a range of valuation, not a fixed number. Sensitivity analysis, Simulation, Goal seek, etc. can be used to find the range of valuation. Use of spreadsheet facilitates this process.

Select Rules for Valuation, contd..

- Rule # 6: Diligently scrutinize the assumptions, data and spreadsheet model.
- Rule # 7: The process of valuation is important, not the value derived out of it.

Valuation in the context of M&A

- Valuation in the context of M&A has some unique features
 - Synergy as a source of valuation
 - Concept of corporate control
 - Comparable cases

Different Methods of Valuation (not an exhaustive list)

Asset Based Valuation	Discounted Cash flow based valuation	Relative Valuation*# Based on financial measures	Relative Valuation*# Based on non-financial measures	Special cases of Valuation
<ul style="list-style-type: none"> • Book value of assets • Market value of assets • Replacement cost 	<ul style="list-style-type: none"> • Dividend discount model • Free cash flow to firm (FCFF) • Free cash flow to equity (FCFE) 	<ul style="list-style-type: none"> • Price-Earning Multiple • Price to cash flow per share • Price to book value • Enterprise value to EBITDA • Enterprise value to EBITDA 	<ul style="list-style-type: none"> • Enterprise value to installed capacity (select manufacturing sectors) • Enterprise value to Gross Merchandise Value (E-commerce) • Enterprise value to Square Feet Area (Retail Business) 	<ul style="list-style-type: none"> • Valuation of synergies • Valuing privately or closely held firms • Valuation of start-ups • Valuation of intangibles

***Also known as comparable company approach**

#Trading vs. Transaction Multiples

CONCLUSION

- There are numerous measures of valuing enterprises and equity.
- One should estimate a range of value, not a fixed one.
- Valuation of M&A is not exactly same as valuation in a day to day trading context.

REFERENCES

1. Bruner, R. F.(2004). *Applied Mergers and Acquisitions*. John Wiley & Sons.
2. Damodaran, A. (2007). *Corporate Finance, Theory and Practice*, John Wiley & Sons.
3. DePamphilis, D. (2019). *Mergers, acquisitions, and other restructuring activities: An integrated approach to process, tools, cases, and solutions*. Academic Press.



Thank you





N P T E L O N L I N E C E R T I F I C A T I O N C O U R S E S

MERGERS, ACQUISITIONS AND CORPORATE RESTRUCTURING

PROF. CHANDRA SEKHAR MISHRA

**Vinod Gupta School of Management
Indian Institute of Technology Kharagpur**

LECTURE: 12

**TITLE: Valuation in M&A: Cash
Flow Based Approach-1**

- Valuation using discounted cash flow
- Cost of capital for different components
- Weighted average cost of capital
- Dividend Discount Model
- Capital Asset Pricing Model
- Levered and unlevered beta



Keywords



- DCF or Discounted Cash flow
- Cost of capital
- Cost of debt
- Cost of equity
- Weighted Average Cost of Capital (WACC)
- Growth
- Terminal value
- CAPM
- Levered and Unlevered beta

Discounted Cash flow (DCF) based valuation

Advantages:

- Reflects time value of money
- Cash Focus
- Multi-period
- Rigorous
- Theoretically based
- Affords many analytical insights

Disadvantages:

- Tough to explain to novices
- Very much time consuming
- Easy to misuse
- Risks “analysis paralysis”

Discounted Cash flow (DCF) based valuation

Basic inputs:

- Estimation of relevant cash flow (dividend or free cash flow)
- The period or duration of estimated cash flow
- Growth in cash flow
- Perpetuity or terminal value
 - Terminal growth rate
- Discounting rate or cost of capital (opportunity cost)

Estimation of Discounting Rate or Cost of Capital

- Cost of Capital: It is also known as weighted average cost of capital (WACC) in the context of enterprise as a whole.
- The expected return for the investor is the cost of capital for a firm.
- Return is a function of risk
- Cost of capital has application in valuation of assets as well as project evaluation

Weighted Average Cost of Capital (WACC)

- WACC is the weighted average of cost of different components of capital.
- Weights can be based on market value or book value. If information is available, market value weights are preferred.
- Cost of capital is calculated on after-tax basis

$$WACC = \sum_{i=1}^n w_i * k_i$$

$$WACC = w_e k_e + w_d k_d + w_p k_p$$

Cost of Debt (K_d)

- Cost of debt is required rate of return on company's debt.
- Yield to maturity can be considered as pre-tax cost of debt, particularly in case of debt which is listed.
- Interest rate charged by the lender can be considered as cost of debt in such cases
- For the purpose WACC, cost of debt has to be adjusted for corporate tax.

Cost of Debt, contd..

An approximate approach to estimate YTM

$$\text{Bond Value} = \frac{\text{Coupon 1}}{(1+YTM)^1} + \frac{\text{Coupon 2}}{(1+YTM)^2} + \dots + \frac{\text{Coupon } n}{(1+YTM)^n} + \frac{\text{Redemption Value } n}{(1+YTM)^n}$$

$$YTM = \frac{C + \left(\frac{F - P}{n}\right)}{\left(\frac{F + P}{2}\right)}$$

$$YTM = \frac{C + \left(\frac{F - P}{n}\right)}{(0.6P + 0.4F)}$$

Cost of Debt, example

Suppose a bond of face value, Rs.1,000 carries a coupon of 10% (**C**). It is presently traded at Rs.1,050 (**P**) and shall be redeemed at par (**F**) after five years (**n**). The coupon is paid annually. What is the YTM? If the company is subject 25% tax rate, what is the post tax cost of debt?

Cost of Preference Share Capital (K_p)

An approximate approach for cost of preference share capital, in line with YTM

$$K_p = \frac{Div_p + \left(\frac{F - P}{n}\right)}{\left(\frac{F + P}{2}\right)}$$

Cost of Preference Share Capital, an example

Suppose a preference share carries 12% dividend (Div_p) rate and it has a face value of Rs.100 and shall be redeemed at par, i.e., Rs.100 (F) after six years. It is presently traded at Rs.94 (P). What is the cost of preference share capital? If the company is subject 30% tax rate, what is the post tax cost of preference share capital?

Cost of Equity (K_e)

- Cost of equity (k_e)
 - Rule of thumb
 - Dividend discount model
 - Capital Asset Pricing Model (CAPM)
- Use of beta in case of CAPM
 - Levered beta
 - Unlevered beta

Cost of Equity (K_e) – Dividend Discount Model

$$P_0 = \frac{D_1}{K_e - g}$$

$$K_e = \frac{D_1}{P_0} + g$$

Where,

- D_1 = Expected dividend in the next year
- P_0 = Present market price of equity share
- g = expected growth rate in dividend

Cost of Equity (K_e) – Dividend Discount Model, an example



Suppose dividend declared and paid in the current year is Rs.8. This is expected to grow at 5% per annum till perpetuity. If the equity share is traded at Rs.70, find the cost of equity using DDM.

Cost of Equity (K_e) – CAPM

$$K_e = R_f + \beta_e [E(R_m) - R_f]$$

Where,

- K_e = cost of equity
- R_f = risk free rate of return
- R_m = market rate of return
- β_e = beta of the stock

Cost of Equity (K_e) – CAPM, an example



A stock has β of 1.2. The risk free rate and market rate of return are 8% and 15% respectively. Find the cost of equity using CAPM.

Beta of an unlisted stock

- The concept of levered and unlevered beta can be used for finding beta of an unlisted stock.

$$\beta_l = \beta_u \left(1 + \frac{D}{E} * (1 - T)\right)$$

$$\beta_u = \frac{\beta_l}{\left(1 + \frac{D}{E} * (1 - T)\right)}$$

CONCLUSION

- There are multiple approaches for estimating cost of capital
- WACC is the average of different component cost of capital

REFERENCES

1. Bruner, R. F.(2004). *Applied Mergers and Acquisitions*,. John Wiley & Sons.
2. Damodaran, A. (2007). *Corporate Finance, Theory and Practice*, John Wiley & Sons.
3. DePamphilis, D. (2019). *Mergers, acquisitions, and other restructuring activities: An integrated approach to process, tools, cases, and solutions*. Academic Press.



Thank you





N P T E L O N L I N E C E R T I F I C A T I O N C O U R S E S

MERGERS, ACQUISITIONS AND CORPORATE RESTRUCTURING

PROF. CHANDRA SEKHAR MISHRA

Vinod Gupta School of Management
Indian Institute of Technology Kharagpur

LECTURE: 13

TITLE: Valuation in M&A: Cash Flow
Based Approach-3 (Cost of Capital)

- Cost of Equity
- Capital Asset Pricing Model
- Levered and unlevered beta
- Weighted Average Cost of Capital (WACC)
- Exercise on WACC calculation



Keywords



- Cost of equity
- CAPM
- Levered and Unlevered beta
- WACC

Cost of Equity (K_e) – CAPM

$$K_e = R_f + \beta_e [E(R_m) - R_f]$$

Where,

- K_e = cost of equity
- R_f = risk free rate of return
- R_m = market rate of return
- β_e = beta of the stock

Beta of an unlisted stock

- The concept of levered and unlevered beta can be used for finding beta of an unlisted stock.

$$\beta_l = \beta_u \left(1 + \frac{D}{E} * (1 - T)\right)$$

$$\beta_u = \frac{\beta_l}{\left(1 + \frac{D}{E} * (1 - T)\right)}$$

Exercises – Levered and Unlevered Beta - 1



	Company A (listed)	Company B (unlisted)
Levered beta	0.9	??
Debt-Equity ratio	0.60	0.40
Tax rate	30%	25%

Exercises – Levered and Unlevered Beta - 2

Beta of the stocks of few comparable companies and other information are given below:

Listed Company	Levered Beta	Debt-Equity Ratio	Tax rate
A	0.85	0.50	25%
B	1.23	0.80	25%
C	0.68	0.75	25%
D	0.78	1.10	25%
E	1.10	0.60	25%
F	0.93	0.70	25%
G	0.82	1.30	25%

Required: to calculate the beta of the stock of the unlisted companies:

Unlisted Company	Debt-Equity Ratio	Tax rate
X	0.45	30%
Y	0.53	30%

Exercises – Calculation of Weighted Average Cost of Capital (WACC)

Particulars	Number	Face value	Market Price	Book value	Book value
Equity share capital					
Paid up capital	40,000	₹ 10	₹ 35	₹ 4,00,000	
Reserves and surplus	N.A.	N.A.	N.A.	₹ 6,00,000	₹ 10,00,000
Preference share capital*	3,000	₹ 100	₹ 95		₹ 3,00,000
Debentures*	800	₹ 1,000	₹ 980		₹ 8,00,000
Total					₹ 21,00,000

	Debentures	Preference Share Capital
*More details		
Interest/ Dividend rate	12%	10%
Number of years to maturity (redemption)	5	8
Redemption value	₹ 1,050	₹ 100

Other relevant information:

Risk free rate of return: 7.00%; Market rate of return: 15.00%;

Beta of equity: 0.80; Tax rate: 25.00%

CONCLUSION

- In case of unlisted stocks, one can find out the proxy beta with the help of beta and other information related to comparable companies.
- WACC is the average of different component cost of capital

REFERENCES

1. Bruner, R. F.(2004). *Applied Mergers and Acquisitions*,. John Wiley & Sons.
2. Damodaran, A. (2007). *Corporate Finance, Theory and Practice*, John Wiley & Sons.
3. DePamphilis, D. (2019). *Mergers, acquisitions, and other restructuring activities: An integrated approach to process, tools, cases, and solutions*. Academic Press.



Thank you





N P T E L O N L I N E C E R T I F I C A T I O N C O U R S E S

MERGERS, ACQUISITIONS AND CORPORATE RESTRUCTURING

Prof. CHANDRA SEKHAR MISHRA

Vinod Gupta School of Management
Indian Institute of Technology Kharagpur

LECTURE: 14

TITLE: Valuation in M&A: Cash Flow
Based Approach-4 (Dividend
Discount Model)

- Dividend Discount Model
- Multi-stage Dividend Growth Model
- Exercises on Dividend Discount Model
- Concept of Free cash flow

Keywords



- Dividend Discount Model
- Growth in Dividend
- Terminal Growth
- Terminal value
- FCFF

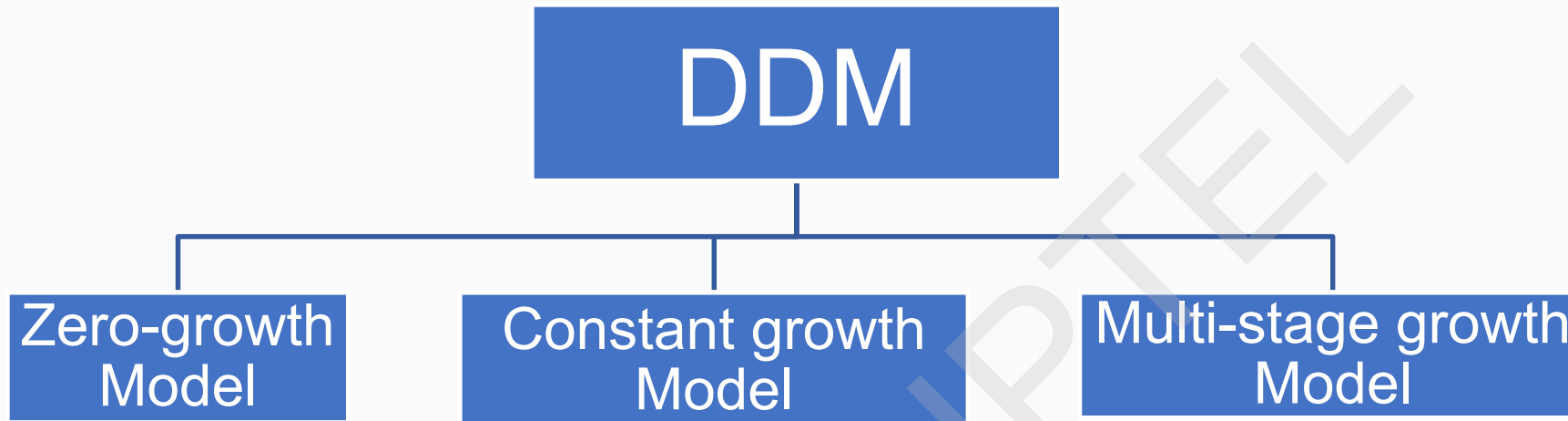
Valuation of Equity Shares using Dividend Discount Model (DDM)

- Concept: The value of an equity share is the present value of dividends to be received in future.
- The generic formula for value of equity share using dividend discounting model:

$$P_0 = \frac{D_1}{(1+K_e)^1} + \frac{D_2}{(1+K_e)^2} + \frac{D_3}{(1+K_e)^3} + \dots + \frac{D_\infty}{(1+K_e)^\infty}$$

- Where,
 - P_0 = Present market price of equity share
 - D_1 to D_∞ = Expected dividend per share (DPS) in year 1 through ∞
 - K_e = Cost of equity or expected rate of return of equity shareholders.

Valuation of Equity Shares using Dividend Discount Model (DDM), contd..



Generic formula for constant growth: earnings retention ratio * rate of return on equity. i.e. $g = b \times r$. Retention ratio = $1 - \text{Dividend pay-out ratio}$.

Valuation of Equity Shares using DDM – Zero-Growth

$$P_0 = \frac{D}{K_e}$$

- Where,
 - P_0 = Present market price of equity share
 - D = Expected dividend per share (DPS) per annum
 - K_e = Cost of equity or expected rate of return of equity shareholders.

Valuation of Equity Shares using DDM – Zero-Growth - Example



1. Suppose dividend per equity share declared and paid in the current year is Rs.6, which is expected to remain constant till perpetuity. Find the value of the equity share if the required rate of return is 15%.

Valuation of Equity Shares using DDM – Constant Growth



$$P_0 = \frac{D_1}{K_e - g}$$

- Where,
 - P_0 = Present market price of equity share
 - D_1 = Expected dividend per share (DPS) in the next year
 - K_e = Cost of equity or expected rate of return of equity shareholders.
 - g = expected growth rate in DPS

Valuation of Equity Shares using DDM – Constant Growth - Example



2. Suppose dividend per equity share (DPS) declared and paid in the current year is Rs.8. The DPS is expected to grow at 4% till perpetuity. Find the value of the equity share if the required rate of return is 12%.

Valuation of Equity Shares using DDM – Multi-stage Growth

$$P_0 = \frac{D_1}{(1+K_e)^1} + \frac{D_2}{(1+K_e)^2} + \frac{D_3}{(1+K_e)^3} + \dots + \frac{D_\infty}{(1+K_e)^\infty}$$

Steps:

1. Estimate the dividend per share from year 1 till constant growth year.
2. Find the terminal value in the year prior to start of constant growth
3. Find the present value of the terminal value
4. Find the present value of dividends from year 1 till year prior to constant growth year.
5. Sum the values in steps 3 and 4 to find the value of equity share

Valuation of Equity Shares using DDM – Multi-stage Growth - Example



3. Suppose dividend per equity share (DPS) declared and paid in the current year is Rs.5. The DPS is expected to grow at 12% till from year 1 till year 3, after which it will grow at 6% till perpetuity. The beta of stock is 0.80. The risk free and market risk premium are 9% and 7% respectively. Find the value of the equity share.

Limitations of DDM

- Forecasting of dividend is not easy.
- Finding the constant growth rate is not a simple process.
- Investors might not be interested in dividend as a return on their investment.

Concept of Free Cash Flow

- Free cash flow to the firm (FCFF)
- Free cash flow to the equity (FCFE)

Generic explanation of FCFF:

Net operating profit after tax (NOPAT) **plus** Depreciation **less** capital expenditure **less** change in net working capital

$$\text{NOPAT} = \text{Earnings before interest and tax (EBIT)} \times (1 - \text{Tax rate})$$

CONCLUSION

- Equity share can be valued using dividend discounting model
- Growth in dividend can be nil, constant or high in initial years followed by constant growth.
- DDM has inherent limitations.

REFERENCES

1. Bruner, R. F.(2004). *Applied Mergers and Acquisitions*,. John Wiley & Sons.
2. Damodaran, A. (2007). *Corporate Finance, Theory and Practice*, John Wiley & Sons.
3. DePamphilis, D. (2019). *Mergers, acquisitions, and other restructuring activities: An integrated approach to process, tools, cases, and solutions*. Academic Press.



Thank you





N P T E L O N L I N E C E R T I F I C A T I O N C O U R S E S

MERGERS, ACQUISITIONS AND CORPORATE RESTRUCTURING

Prof. CHANDRA SEKHAR MISHRA

Vinod Gupta School of Management
Indian Institute of Technology Kharagpur

LECTURE: 15

TITLE: Valuation in M&A: Cash Flow
Based Approach-4 (Free Cash
Flow Models)

oncepts covered



- **Concept of Free cash flow**
- **Free cash flow to firm**
- **Free cash flow to equity**
- **Valuation using FCFF**

Keywords



- Valuation
- FCFF
- FCFE
- Terminal value

Valuation of Company or Equity Shares using Free Cash Flow (FCF)

- Concept: The value of an enterprise (**equity**) share is the present value of future free cash flow to firm (**equity**).
- The generic formula for valuation using free cash flow:

$$P_0 = \frac{FCF_1}{(1+k)^1} + \frac{FCF_2}{(1+k)^2} + \frac{FCF_3}{(1+k)^3} + \dots + \frac{FCF_\infty}{(1+k)^\infty}$$

- Where,
 - P_0 = Present value of firm or enterprise (**Equity**)
 - FCF_1 to FCF_∞ = Expected free cash flow for firm (**equity**)
 - K = Cost of capital of firm or enterprise (**equity**)

Concept of Free Cash Flow

- Free cash flow to the firm (FCFF)
 - also known as unlevered free cash flow, i.e. without any impact of interest payment, debt repayment or new debt.
 - It is also known as cash flow from assets.
- Free cash flow to the equity (FCFE)
 - also known as levered free cash flow. i.e. with impact of interest payment, debt repayment or new debt.

Free Cash Flow to Firm (FCFF)

- Generic explanation of FCFF: the cash that the firm is free to distribute to creditors (lenders) and shareholders, since the requirements for working capital and capital expenditure are already taken care of.
- $FCFF = \text{Net operating profit after tax (NOPAT)} + \text{Non-cash charges (e.g. Depreciation)} - \text{capital expenditure} + / - \text{change in net working capital}$
 - $NOPAT = \text{Earnings before interest and tax (EBIT)} \times (1 - \text{Tax rate})$
 - Change in net working capital: change in current assets, except cash less change in current liabilities

Free Cash Flow to Firm: Example

ABC Limited			
Particulars/ Year	20X3	20X2	20X1
Revenue from operations	₹ 1,000	₹ 900	
Operating expenses, excluding depreciation	₹ 540	₹ 480	
EBIDTA*	₹ 460	₹ 420	
Depreciation and amortization	₹ 120	₹ 100	
Earnings before interest and tax (EBIT)	₹ 340	₹ 320	
Tax rate	25%	25%	
Current assets except cash	₹ 540	₹ 480	₹ 410
Current liabilities	₹ 300	₹ 250	₹ 220
Capex	₹ 50	₹ 45	

*Earnings before interest, depreciation, tax and amortization

Free Cash Flow to Equity (FCFE)

- Generic explanation of FCFE: the cash flow available for distribution to the shareholders after taking care of working capital, capital expenditure and debt repayments.
- Net profit **plus** Non-cash charges (e.g. Depreciation) **minus** capital expenditure **plus/minus** change in net working capital **plus** net debt issued
 - Change in net working capital: change in current assets, except cash less change in current liabilities
 - Net debt = new debt **minus** debt repayment

Free Cash Flow to Equity: Example

PQR Limited			
Particulars/ Year	20X3	20X2	20X1
Net profit	₹ 400	₹ 250	
Depreciation and amortization	₹ 70	₹ 60	
Current assets except cash	₹ 430	₹ 350	₹ 290
Current liabilities	₹ 280	₹ 210	₹ 180
Capex	₹ 40	₹ 30	₹ 30
New debt issued	₹ 120	₹ 90	
Debt repaid	₹ 45	₹ 30	

Valuation of Firm using FCFF - Example

- Beta Limited is expected to generate FCFF of Rs.140 crore in the next year which is expected to grow at 5% per annum till perpetuity. What is the value of the company if the weighted average cost of capital is 12%?

Valuation of Firm using FCFF – Example, contd..

- Alpha Limited is expected to generate FCFF of Rs.200 crore, Rs.250 crore and Rs.280 crore in the next three years. After third year, the FCFF is expected to grow at 4% per annum till perpetuity. What is the value of the company if the weighted average cost of capital is 10%? [Hint: use terminal value]

CONCLUSION

- There are two generic free cash flows: FCFF and FCFE
- FCFF can be used to value the firm.
- FCFE can be used to value the equity.
- Free cash flow considers cash flow only related to operating assets of the company. *Non-operating assets of the company have to be valued separately and added to the value using free cash flow to find the enterprise value.*

REFERENCES

1. Bruner, R. F.(2004). *Applied Mergers and Acquisitions*,. John Wiley & Sons.
2. Damodaran, A. (2007). *Corporate Finance, Theory and Practice*, John Wiley & Sons.
3. DePamphilis, D. (2019). *Mergers, acquisitions, and other restructuring activities: An integrated approach to process, tools, cases, and solutions*. Academic Press.



Thank you

