FNCE10002

5 CAPITAL STRUCTURE AND PAYOUT POLICY

- Financial leverage: when companies use debt in their capital structure
- Levered company: company with debt on its balance sheet
- Unlevered company: finances operations entirely with equity
- Levered: debt magnifies a company's financial performance
- Recapitalisation: alteration of a company's capital structure to change the relative mix of debt and equity financing
- Effects of financial leverage
    - Expected rate of return on equity ↑
    - Variability of returns to shareholders ↑
    - ↑ Leverage involves a trade-off between risk and return

Modigliani-Miller

- Perfect capital market conditions:
    1. Firms and investors can trade the same set of securities at competitive market prices
    2. There are no taxes, transaction costs or issuance costs
    3. Firms have a fixed investment policy, and their investment decisions are not affected by their financing decisions
    4. We also assume perpetual cash flows (earnings) to simplify the analysis

3 states:

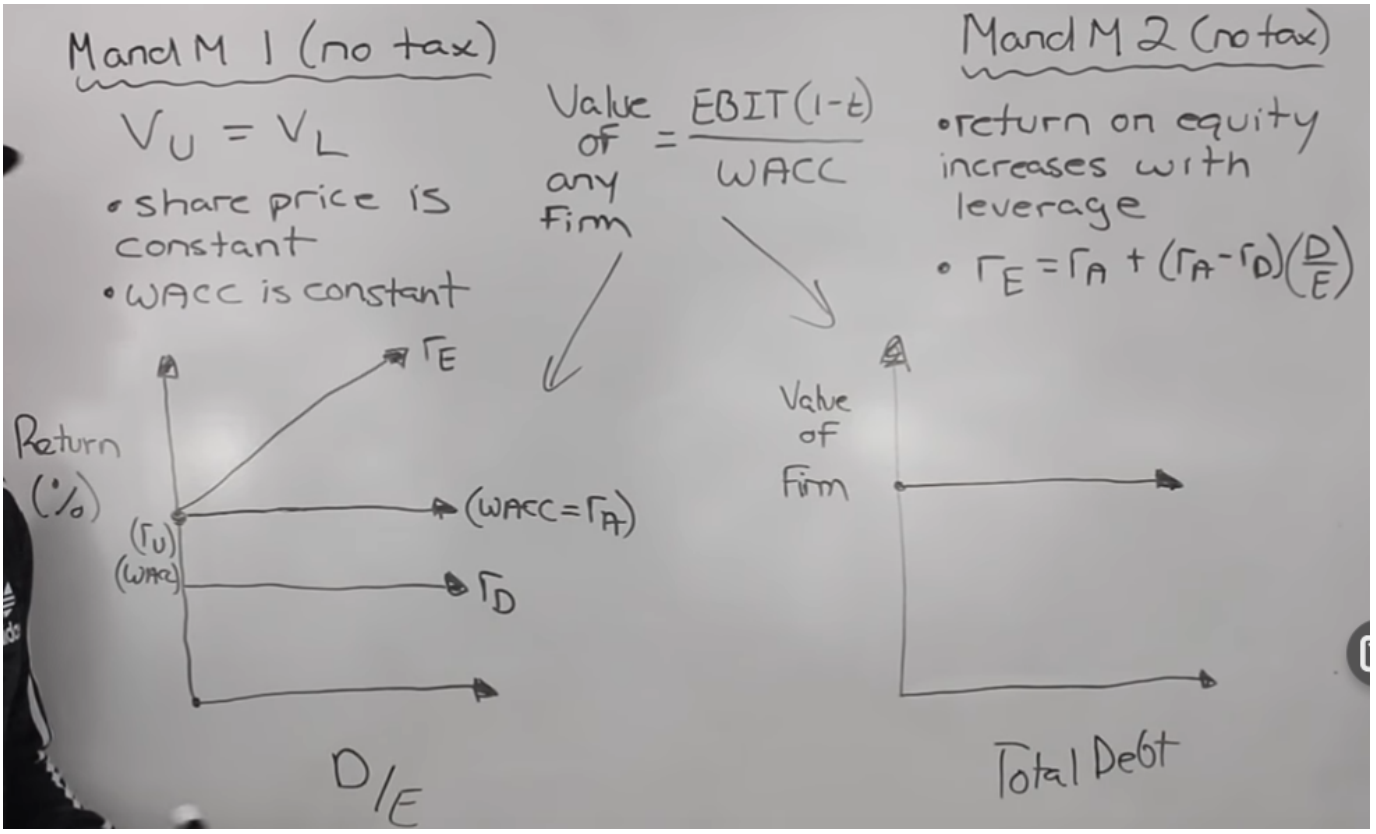
1. State 1: Economic recession
    - EPS ↓; ROE↓
2. State 2: Economic normality
    - EPS ↑; ROE↑
3. State 3: Economic boom
    - EPS ↑; ROE↑

Capital Structure	Risk	Return	Ownership	Payments	Operational Flexibility
Debt	Low risk • First claim on assets in the event of bankruptcy	Low return • Interest • Capital back	No ownership rights	• Fixed repayment schedule • Interest payments	Has restrictions on operational flexibility
Equity	High risk • Only receive residual value after debt investors are repaid	High return • Dividend • Capital growth	Ownership rights – voting rights	• No mandatory fixed payments (dividends are discretionary) • No interest payments	Provides maximum operational flexibility

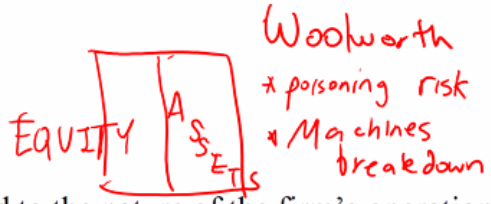
Methods of Recapitalization

A firm can optimize their capital structure by changing the mix of debt and equity. There are a few methods of recapitalization available:

1. Issue debt and repurchase equity	2. Issue debt and pay a large dividend to equity investors	3. Issue equity and repay debt
Debt ↑	Debt ↑	Debt ↓
Equity ↓	Equity ↓	Equity ↑



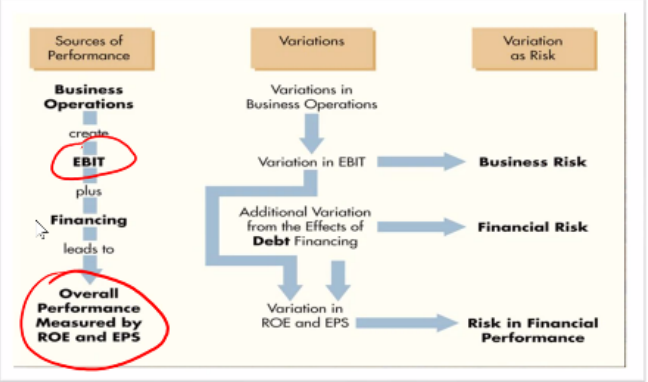
Business Risk and Financial Risk (Levrage)



- The two main risks faced by firms are…
- Business (or operational) risk
  - The variability of future net cash flows attributed to the nature of the firm's operations
  - It is the risk faced by shareholders *if* the firm were financed only by equity
- Financial risk
  - The risk attributed to the use of debt as a source of financing a firm's operations
  - Surveys of managers indicate that they spend a lot of time quantifying and managing financial risk

Financial Levearage

- Financial risk exists if the firm's operations are financed using debt, that is, when there is financial leverage
  - Financial leverage is measured as the debt-to-equity (D/E) or the debt-to-total-assets or debt-to-value [$D/(D + E)$] ratios
- Effects of financial leverage?
  - Expected rate of return on equity increases
  - The variability of returns to shareholders also increases
  - Increasing leverage involves a trade-off between risk and return!



Note: *EBIT* is earnings before interest and taxes, *ROE* is return on equity and *EPS* is earnings per share

Modigliani and Miller (M&M) framework

- Our theoretical setting for analyzing the capital structure decisions of firms is based on the analysis of Modigliani and Miller (1958, 1963)
- The Modigliani and Miller (MM) analysis is based on the assumption that capital markets are perfect…
  - Firms and investors can trade the same set of securities at competitive market prices
  - There are no taxes, transaction costs or issuance costs
  - Firms have a fixed investment policy and their investment decisions are not affected by their financing decisions
  - There are no costs associated with firm liquidation

Modigliani and Miller (M&M) Capital Structure Theory (No Taxes)

- In perfect capital markets with no corporate taxes, the market value of a firm is independent of its capital structure
- In perfect capital markets with no corporate taxes, leverage increase the risk variability of a firm's earnings and its systematic risk

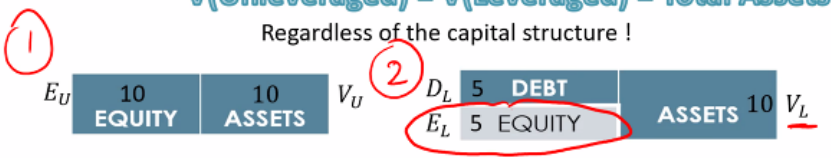
State of the Economy	*Recession*		*Normal*		*Boom*	
	No debt	*50% debt*	*No debt*	*50% debt*	*No debt*	*50% debt*
EBIT	$500,000	$500,000	$1,000,000	$1,000,000	$1,500,000	$1,500,000
Minus Interest on debt (6%)	$0	$300,000	$0	$300,000	$0	$300,000
Equals Net income	$500,000	$200,000	$1,000,000	$700,000	$1,500,000	$1,200,000
Shares outstanding	200,000	100,000	200,000	100,000	200,000	100,000
Earnings per share (*EPS*)[1]	$2.50	$2.00	$5.00	$7.00	$7.50	$12.00
Return on assets (*ROA*)[2]	5.0%	5.0%	10.0%	10.0%	15.0%	15.0%
Return on equity (*ROE*)[3]	5.0%	4.0%	10.0%	14.0%	15.0%	24.0%

1. Earnings per share, *EPS* = Net income/Number of shares
2. Return on assets, *ROA* = *EBIT*/Market value of firm
3. Return on equity, *ROE* = Net income/Market value of equity

	Current Structure	*Proposed Structure*
Total assets	$10,000,000	$10,000,000
Total equity	$10,000,000	$5,000,000
Total debt	$0	$5,000,000
Debt-to-equity ratio	0.0	1.0
EBIT	$1,000,000	$1,000,000
Shares outstanding	200,000	100,000
Share price	$50.00	$50.00
Interest rate on debt	–	6%

V(Unleveraged) = V(Leveraged) = Total Assets

Regardless of the capital structure !



SUMMARY OF CURRENT AND PROPOSED CAPITAL STRUCTURES

	Current	Proposed
Assets - Assets = EBIT/Required rate of return - Assets = Equity + Debt		
Equity		
Debt		
Debt-to-equity ratio - D/E		
EBIT		Unchanged

- Expected EBIT = (⅓)$ EBIT normal growth + (⅓) $ EBIT recession + (⅓) $ EBIT boom		
Shares outstanding		
Share price		
Interest rate on debt		

EXPECTED CASH FLOWS TO SHAREHOLDERS AND BONDHOLDERS UNDER THE CURRENT AND PROPOSED CAPITAL STRUCTURES

- Assuming EBIT = $___ and economy grows at a normal rate
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	Current Structure	Proposed Structure
EBIT		
Interest (__%)		
Net Income		
Shares outstanding		
Earnings per share (EPS) - EPS = (EBIT - Interest) / Number of shares - Earnings = EBIT - Interest - EPS= (⅓)$ EPS normal growth + (⅓) $ EPS recession + (⅓) $ EPS boom		
Return on equity (ROE) - ROE = Net income/Equity - ROE = EPS/Share Price - ROE = Earnings/EBIT - ROW = (⅓)$ ROE normal growth + (⅓) $ ROE recession + (⅓) $ ROE boom		

State of Economy	Recession		Normal	Boom		
	Current	Proposed	Current	Proposed	Current	Proposed
EBIT						
Interest on debt						
Net Income						

Shares outstanding						
Earnings per share (EPS)						
Return on Assets (ROA) - ROA=EBIT/Assets		Unchanged		Unchanged		Unchanged
Return on equity (ROE) - Net income/Equity						

- Breakeven Level of EBIT (EBIT*)
  - When two capital structures result in the same EPS
  - EPS (current) = EPS (proposed)
  - EPS (current/proposed) = (EBIT* - Interest) / Number of shares
  - Solve for EBIT*
- Breakeven ROA
  - ROA = EBIT/Assets
- Security Market Line (SML) equation

$$E(r_j) = r_f + [E(r_m) - r_f]\beta_j$$

  - $E(r_j)$: Expected return from your investment
  - $E(r_m)$: Expected return from the market
  - r_f: Risk-Free return
- If not mentioned, tax rate = 30%
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1	Debt-to-equity ratio	$\frac{D}{E}$	
	Value	$V = (D + E)$ $V = \frac{EBIT}{r}$	the company's market value equals the present value of the EBIT it generates regardless of the capital structure it chooses
	Debt-to-value ratio	$\frac{D}{V} = \left[\frac{D}{(D+E)}\right]$	
	Equity-to-value ratio	$\frac{E}{V} = \left[\frac{E}{(D+E)}\right]$ $\frac{E}{V} = 1 - \frac{D}{V}$	

Symbol	Meaning	Units
D	(Market Value of) Debt	
E	(Market Value of) Equity	
$D + E$	Value/Market value of assets	
EBIT	Earnings before interest and taxes	Net operating income stream each year for the foreseeable future
EPS	Earnings per share	Net income/Number of shares
ROE	Return on equity	Net income/Market value of equity
ROA	Return on assets	EBIT/Market value of firm