CORPORATE FINANCE REVIEW NOTES

TOPICS

- **Working Capital Management (day-to-day operations, diagnostics)**
  - **Pro formas**
  - **Optimal capital structure**
  - **Dynamic capital structure**
- **Capital Structure and Dividend Policy**
  - **Static**
  - **Dynamic**
- **Valuation**
  - **WACC**
  - **APV**
  - **FCFE**
  - **EVA**
- **Real Options**
- **Risk Management**
- **Project Finance**
- **Mergers, acquisitions, LBOs, restructurings and bankruptcies**
- **Security design**

FUNCTIONS OF A CFO

"Cash, not earnings, keeps the firm alive"

1. Make good investment decisions
2. Make good financing decisions
3. Ensure that the firm does not run out of cash

CFOs create value by exploiting market imperfections in the product, labor and capital markets.

1. Create market imperfections and exploit them
2. Discover market imperfections and exploit them

Once corporate strategy is established in the product markets, corporate finance strategy can be planned.

Recall Massey Ferguson: A risky product strategy can be made even riskier by a risky financing strategy that can impact the product market or the product market strategy. **If the firm is undertaking a risky product strategy, it should undertake a risky financing strategy if and only if its financial strategy can have no impact on its product market strategy.**

WORKING CAPITAL

The Cash Cycle *"Collect early, pay late"*

Inventory/receivables: Purchase an item → Sell the item → Receive the cash
Payables: Buy the item → Finance the item → Receive cash on A/R → Pay for the item

Sources of Funds	Uses of Funds
A/P ↑	A/R ↑
Retained Earnings ↑	Inventory ↑
Gross margin ↑	N/P ↓
	SG&A % ↑

Cash Flow Calculation	
Increase in Assets	Use of Cash
Decrease in Assets	Source of Cash
Increase in Liabilities	Source of Cash
Decrease in Liabilities	Use of Cash

Purpose of ratio analysis: to compare the firm to other firms and to compare the firm to itself (over time)

Types of ratio analysis:

- Profitability
- Liquidity
- Control/Operating
- Leverage

Profitability Ratios:

Rate of Return on Assets: measures a firm's success in using assets to generate earnings independent of the financing of those assets (i.e. debt versus equity)

$$ROA = \frac{NI* + (1-t)(Int.Exp.) + Min.Interest\ in\ Earnings}{Average\ Total\ Assets}$$

$$NI* = NI + \Pr eferred\ Dividends$$

Here, NI refers to Net Income available to common shareholders.

$$ROA = \Pr ofit\ M\arg in \times Asset\ Turnover$$

$$ROA = ROE \times \left(\frac{NI}{NI*}\right) \times \left(\frac{Average\ Total\ Assets}{Average\ Common\ Equity}\right)$$

$$ROE = \left(\frac{NI}{Sales}\right) \times \left(\frac{Sales}{Assets}\right) \times \left(\frac{Assets}{Average\ Common\ Equity}\right)$$

$$ROE = \Pr ofitability \times Asset\ Turnover \times Leverage$$

ROE will be greater than ROA when ROA is greater than the cost of capital provided by creditors and preferred shareholders. When a firm generates earnings using capital provided by creditors and preferred shareholders that exceeds the costs of such capital, the "excess" return belongs to common shareholders.

Sustainable growth rate g*: The level of growth that can be sustained by internally generated funds. It is the level of growth that can be sustained without needing to raise either debt or equity.

$$g* = ROE \times (1-d)$$

Liquidity Ratios:

- Sheds light on the firm's ability to pay for obligations that come due during the operating cycle

$$Current\ Ratio = \frac{Current\ Assets}{Current\ Liabilities}$$

- An increase of equal amount in both → a decrease in the ratio when it is higher than 1.0 ex ante and an increase in the current ratio if it is less than 1.0 ex ante
- A very high current ratio may accompany unsatisfactory business conditions
- A falling ratio may accompany profitable operations → e.g. lower inventories
- In a recessionary period, businesses contract, firms pay current liabilities, current ratio goes up, even though current assets reach a low point
- Reverse can occur in a boom

$$Quick\ Ratio = \frac{Cash + Market\ Securities + Accounts\ \Re ceivable}{Current\ Liabilities}$$

- Includes in the numerator only those elements that can be quickly converted to cash

$$CFO\ to\ CL = \frac{Operating\ Cash\ Flow}{Average\ Current\ Liabilities}$$

- Based on cash flow **after** the funding needs for working capital (i.e. A/R and Inventory) have been made
- Average CL used in the denominator to be consistent with the numerator (cash flow from operations generated over the course of the year)
- A ratio of 1.0 would be interpreted as: The firm could pay, if it had to, 100% of its CL out of the cash it generates from operations (i.e. without external funding)

Operating/Control Ratios:

$$Accounts\ Receivable\ Turnover\ = \frac{Net\ Sales\ on\ Account}{Average\ Accounts\ Receivable}$$

- Prefer a higher A/R turnover → less credit risk outstanding
- A/R are a use of funds

$$Days\ Receivable\ Turnover\ = \frac{365}{Accounts\ Receivable\ Turnover}$$

- The rate at which A/R are being collected → prefer a lower #
- Sustained increase might mean:
  - Higher percentage of sales from A/R → deteriorating customer base in terms of credit, or that the credit department is doing a poor job or that the credit department is being too aggressive
- Sensitive to the general economy

$$Inventory\ Turnover\ = \frac{COGS}{Average\ Inventory}$$

- Number of times you cycle through inventory in a year → prefer high
- Too low → could mean inventory is becoming obsolete
- Too high → could mean you lose sales because of shortages
- Optimal tradeoff
- Inventory is a use of funds

$$Days\ Inventory\ Held\ = \frac{365}{Inventory\ Turnover}$$

- Prefer a lower number → keep the minimum amt of inventory necessary
- More efficient use of working capital

$$Fixed\ Asset\ Turnover\ = \frac{Sales}{Average\ Fixed\ Assets}$$

- How many sales generated per $ of assets → higher better
- Could dip as firm makes investment before realizing sales in later periods
- Or, firm could cut back on CapEx, pumping up Fixed Asset Turnover, because prospects are poor
- Assets are a use of funds

$$Accounts\ Payable\ Turnover\ = \frac{Purchases}{Average\ Accounts\ Payable}$$

- How many times a year does the firm pay off its suppliers

$$Days\ Payable\ = \frac{365}{Accounts\ Payable\ Turnover}$$

- A measure of how quickly the firm is paying its suppliers
- Longer better → source of funds

Leverage Ratios:

$$Long\ Term\ Debt\ Ratio = \frac{Long\ Term\ Debt}{Long\ Term\ Debt + Shareholders'\ Equity}$$

$$Debt-to-Equity\ Ratio = \frac{Long\ Term\ Debt}{Shareholders'\ Equity}$$

$$Liabilities-to-Assets\ Ratio = \frac{Total\ Liabilities}{Total\ Assets}$$

$$Interest\ Coverage\ Ratio = \frac{NI + Int.Exp. + Inc.Tax.Exp. + Min.Int.in\ Earnings}{Interest\ Expense}$$

Interest coverage ratios less than 2.0 suggest a risky situation.

- If a firm must make other required periodic payments (e.g. pensions, leases), the analyst could include them as well (if so, then referred to as the fixed charges ratio)
- Uses earnings rather than cash flows in the numerator
- Problematic since firms pay fixed charges with cash not earnings

$$Fixed\ Charges\ Ratio = \frac{NI + Periodic\ Payments}{Interest\ Expense}$$

$$Cash\ Interest\ Coverage\ Ratio =$$
$$\frac{CFO + Cash\ Interest\ Payments + Cash\ Income\ Tax\ Payments}{Cash\ Interest\ Payments}$$

$$Fixed\ Charge\ Coverage\ Ratio =$$
$$\frac{Net\ Income + Noncash\ Charges}{Current\ Maturities + Dividends + Replacement\ CapEx}$$

$$CFO\ to\ TL\ Ratio = \frac{Cash\ Flow\ from\ Continuing\ Operations}{Average\ Total\ Liabilities}$$

- Typically, long-term financing is used for fixed assets (75%) and for working capital (25%)

Growth and Cash Flow

- 2 effects:
  - Revenue growth
  - Changes in operating efficiency
- **Growth does not guarantee an increase in operating cash flow**
  - Revenue --> Increased cash into the company
  - Expenses --> consumption of cash
  - If positive operating margin --> net effect **should** be positive on operating cash flow
  - Investments in accounts receivable and inventory --> use of cash
  - Increased accounts payable credit --> source of cash

- Key factors:
  - Rate of growth
  - Firm's operating profit margin (gross margin, SG&A)
    - Declining gross margin --> more cash generated by sales used for inventory
    - Increased SG&A --> More revenue dollars spent on these operating items
    - **Implications for future profit rates**
  - Management of A/R, Inventory and A/P

- To calculate the cash flow effects of growth on gross profit, SG&A, we multiply the growth in revenue during the current year by the prior year's profitability measures
- Cash flow effects of growth
  - On A/R is computed as the product of growth in revenue per day during the current year by A/R days in the prior year
  - On inventory and A/P are the product of growth in sales per day during the current year by the previous year's inventory days and A/P days, respectively
- **The higher a company's profitability rate and the lower its required commitments to A/R and Inventory, the faster it can grow and provide positive operating cash flow**
- Cash flow effects of changes in profitability and efficiency:
  - Multiply the change in gross margin and SGA% during the current year by the current year's revenue
  - On A/R, multiply the change in A/R days during the current year by revenue per day in the current year
  - On Inventory and A/P, multiply the change in Inventory Days and A/P days during the current year by the current year's revenue

Red Flags

- Look for creativity in classifying cash flows
- Anticipate earnings surprises
- **Growing discrepancy between net income and operating cash flows**
  - Premature recognition of revenues --> operating–related balance sheet assets
  - Expenses may be accrued early --> increases in operating liability --> **operating cash flow will exceed income**
  - Undervaluation of liabilities
  - Overcapitalization --> income smoothing by capitalizing costs that are usually expensed, deferring expenses to a later period
    - Asset write downs in later periods --> no cash flow effect
- Investing:
  - Increased investment if high growth forecasted by management
  - Effect of the nature of the business
    - Capital intensive?
    - Distribution/retailing?
    - Relationship to current operating performance
- Financing:
  - Effect of the nature of the business
    - Debt capacity of assets increases in:
      - Tangible assets
      - Steady cash flow generation
      - Investment not unique to the firm
      - Tax advantage of debt
    - Related to current operating performance
      - **Growth associated with investing and financing**

5 Things to do with extra cash:
• Grow faster internally (product strategy)
• Acquisitions (product strategy)
• Increase dividend payments (financial strategy)
• Buy back debt (financial strategy)

• Buyback stock (financial strategy)

CAPITAL STRUCTURE AND DIVIDEND POLICY

Develop Corporate Strategy first, then develop Financing Strategy second

Financing Strategy Framework
Financial policies include:
Dividends
D/E
Fixed vs. floating
Short vs. long
Pre-funding
Securities issued
Preferential/Non-preferential
Risk management

Debt Policy
D/(D+E)
Interest Coverage
Credit Ratings
Fixed vs. Floating
Long vs. Short maturity
Public vs. Private
US vs. Europe

Equity Policy
Type:
Straight preferred
Preferred (fixed vs. floating)
Convertibles
PERCs (Preferred Equity Residual Claim)
Dividends (Payout level, stability, DRIP program)
Rules
Don't dilute EPS
Don't issue < Book
Don't issue if you have overhanging converts
Don't issue < previous issue price

Framework:

What is the product risk?

What is the financing risk?

What is the financial situation?

What is the most appropriate financing risk, given

the product risk?

Example tradeoff analysis:

Debt +	Debt -	Equity +	Equity -
Tax shield cheaper	Costs of Financial Distress	Safer	More expensive
No dilution (if you expect the stock price to increase)		Not yet a cash cow	Dilution
Maintain control		Debt ratio already high	

- Debt brings focus
- If you don't lever up, someone will take you over and lever you up

Once the financing strategy is determined, it becomes a question of **execution**

In Efficient Capital Markets, you cannot make money out of publicly available information. But there is an asymmetric information problem, in that some people within the firm will have proprietary information about the firm's true worth.

- Dividends and repurchases are vehicles for communicating information to shareholders, signaling management's assessment of a company's performance and its prospects (Asquith and Mullins)
- Repurchases appear more suited for episodic signaling, appropriate whenever a firm's management is convinced that its stock is undervalued. To be most effective, management must be willing to back its conviction by paying a premium for a significant percentage of its shares.
- Dividends appear to be the appropriate vehicle for regular, relatively frequent communication of management's ongoing assessments of a firm's prospects.
- Decisions concerning dividends, repurchases and equity issues are interrelated. These decisions must be determined jointly to avoid paying the cost inherent in violating the cash flow constraint and reducing dividends and/or issuing equity.

THE DIVIDEND PUZZLE: Miller and Modigliani (1961) showed that with a given investment and financing policy, a firm's dividend policy should not affect the value of its shares (ignoring all imperfections).

- Ex-dividend performance of share price
- Question: How can investors benefit from a dividend when it is, in effect, paid dollar for dollar out the value of their shares?
- Why are dividends so prevalent?

Dividends:

- **Initiating the payment of cash dividends generated a positive abnormal return to shareholders averaging almost 5% on announcement day**
    - Over and above return accruing to owners of other stocks of the same risk level and is not the result of other contemporaneous announcements
- Concentrated primarily on the announcement date
- Picks up an additional 1% in the 12 trading days after the announcement
- Persistent 90 trading days later at +6%
- Reasonably consistent across firms
- **Magnitude of benefit is directly proportional to the size of the dividend**
    - Consistent with the signal hypothesis
- Any negative tax burden and/or financing costs associated with dividends is more than offset by the benefits of the dividends
- Once a dividend policy is established, investors may be more successful in forecasting future dividends

Stock buybacks:

- Repurchases may be expected to be more favorable than dividends because of preferential tax treatment (capital gains vs. ordinary income for dividends)
- Repurchases have costs involved:
    - Tax liabilities for some investors
    - Future funding requirements may mean transactions costs
    - Premium usually paid to investors tendering their shares
- Three possible explanations for repurchases:
    - Preferable to dividends (although not perfect) from a tax perspective
    - A firm can radically alter its capital structure → benefits of higher leverage
    - Product of recommendations of a vested group: investment bankers
- Most managers say they buy back their stock because it is underpriced

- Strong enough conviction to pay a premium despite the risk of dilution if they are wrong

Mechanics of Buybacks:

- Tender offers
    - Increase stock prices
    - Abnormal return during the announcement period averages 17%, 13% of which is permanent (after expiry of the tender offer)
    - Effective signal of undervalued stock assessment
    - Magnitude of the benefits to investors is positively related to:
        - The premium paid
        - The percentage of outstanding shares repurchased
        - The fraction of the firm's shares owned by insiders
- Open-market repurchases
    - Permanent gain of 2%
    - Effective signal of undervalued stock assessment
    - Repurchases may be subject to capital gains tax rates only if the distribution is "essentially not equivalent to" paying a dividend

Signaling:

- False signaling may mislead the market for a short time; retribution is ineluctable
- Paying dividends proves that a firm is able to generate cash, rather than just accounting numbers
- Management has an incentive to perform well enough to maintain its dividend and avoid the adverse consequences of a dividend cut or any equity issue to replace the funds out
- False signaling is punished for both dividends and repurchases
    - Generates expectations of future dividends → otherwise price falls
    - Substantial reductions when dividends are cut, greater than the gains from initiating and increasing dividends
    - Possible adverse effects of altering investment and capital structure policy in an attempt to sustain an excessive dividend payout
- There are no equally effective, less costly ways to convey information
    - Lack the credibility of cold hard cash
    - Dividend decisions are forward-looking, unlike accounting statements
    - Dividends are simple and visible
    - Dividends convey information without releasing sensitive details that may be useful to competitors

Policy implications:

- Unclear prescription
    - Closely held firms may not need dividends to communicate with shareholders
    - May be more effective for lower risk firms
- If anything:
    - Set dividends to reflect management's estimate of the lower bound of future intermediate-term earnings
    - Do not increase dividends unless confident that the higher level can be maintained
    - Reduce dividends only if absolutely necessary

THE EQUITY ISSUE PUZZLE: Why do firms rely so heavily on internally generated funds as their chief source of equity financing and why are they correspondingly reluctant to issue common stock?

Empirical Results

- Equity issues reduced stock prices, on average by 3% the day the offering was announced
    - Pervasive among sample offerings
- Reduction persists for many trading days after the announcement
- The size of the reduction is proportional to the size of the offering
- On average, when an equity issue is announced, the loss in market value is 31% of the funds raised

- o Almost 25% of the sample offerings produced reductions in market value greater than 50% of the funds raised
- o For 6% of the offerings, shareholders lost more on announcement day than the total proceeds from the equity offering
- Interpretations:
  - o A dilution of shareholder value in which the firm's aggregate market value does not go up as fast as the number of shares (post-issue)
  - o A substantial portion of the proceeds of an equity issue comes out of the pockets of the current shareholders
    - On average, after $100 mm of new equity is raised, the market value of the firm has increased by only $69 mm
    - The other $31 mm is "donated" by existing shareholders in the announcement period price reduction
- Firms issue equity when stock prices are generally rising
- No ability to time the general level of stock prices
- In the two years prior to the offering, sample firms on average outperform the market by about 40%; in the ten days concluding wit the announcement of the stock issue, sample firms stock prices fall by 5%
- The price reduction associated with issuing the equity is related to the firm's market-adjusted performance prior to the issue
- Poorer stock price performance in the months preceding the offering is associated with larger price reductions

Explaining the Negative Market Reaction

- Possible (but incorrect) explanations:
  - o EPS dilution
  - o Supply-demand imbalance (or price pressure effects)
  - o Valuation effects of a change in the debt-equity ratio
- Reasons to reject
  - o Price reduction inconsistent with predictions based upon these three hypotheses
  - o Negative market reaction varies widely across firms and by offering
  - o Not supported by reaction to secondary stock offerings and sales by knowledgeable insiders
- Equity issues as negative signals
  - o Management belief that the price is overvalued
  - o New equity issues typically a small share of outstanding float
  - o The size of the issue represents the size of the signal
  - o Consistent with selling after a period of superior stock performance (suggesting that management does not foresee this continued strong performance continuing)

Rationale

- Selling stock when the market may be overly optimistic may benefit the firm and its existing shareholders
- An issue may make sense if the firm has worthwhile investment projects, insufficient internal funds and insufficient debt capacity (benefits > cost)
- Negative signal in the issue may require the firm to forgo some profitable investment opportunities

NOTES ON MODIGLIANI-MILLER

Proposition I: Firm value is determined on the left-hand side of the balance sheet by real assets – not by the proportions of debt and equity securities issued by the firm. Financial leverage has no effect on shareholders' wealth.

- It is a law of conservation of value: the value of the pie is independent of how it is sliced (assuming nothing is lost in the slicing)
- Combining assets and splitting them up will not affect values as long as they do not affect investors' choices
- The firm's choice of capital structure is a marketing problem

- o The financial manager's problem is to find the combination of securities that has the greatest overall appeal to investors: the combination that maximizes the market value of the firm
- Implications:
  - o Leverage increases the expected stream of EPS but not the share price
    - The change in the expected earnings stream is exactly offset by a change in the rate at which the earnings are capitalized

$$r_E = r_A + \frac{D}{E}(r_A - r_D)$$

Proposition II: The expected rate of return on the common stock of a levered firm increases in proportion to the debt/equity ratio (D/E), expressed in market values. The rate of increase depends on the spread between r_A, the expected rate of return on a portfolio of all the firm's securities, and r_D, the expected rate of return on the firm's debt.

- At low levels of D/E, r_D is independent of D/E
- At high levels of D/E, the risk of default increases and r_D increases
  - o This occurs when the rate of increase in r_E slows down
  - o The more debt the firm has, the less sensitive r_E is to further borrowing
  - o At high levels of D/E, holders of the firm's debt bear some of the business risk (they might not get paid, or paid in full)
  - o **As the firm borrows more, more of the business risk is transferred from stockholders to bondholders**
- Any increase in r_E is accompanied by a higher risk profile

$$\beta_A = \left(\frac{D}{D+E} \times \beta_D\right) + \left(\frac{E}{D+E} \times \beta_E\right)$$

- This implies that

$$\beta_E = \beta_A + \frac{D}{E}(\beta_A - \beta_D)$$

  - o **The risk of equity exceeds the risk of the firm as the firm is leveraged and with the size of the spread between the risk of the firm and the risk of the firm's debt**

MM & Taxes: Corrected version of MM I in which there is a tax-benefit from having debt as a financing vehicle: the tax-deductibility of interest rate payments.

$$V_{Firm} = V_{All\ Equity} + PV_{Tax\ Shield} - PV_{Costs\ of\ Financial\ Distress}$$

Notes on Debt and Risk:

- Generally $k_D < k_E$
- Adding D/(D+E) → k_D ↑ and k_E ↑ but $k_D < k_E$ still
- Adding D/(D+E) → EPS ↑
  - o Replacing expensive equity with cheaper debt
- P/E ↓ as D/(D+E) increases
  - o P = f(k_E, EPS) ← A homogenous function in EPS
  - o If k_E doesn't change → %Δ EPS = %ΔP
  - o But if k_E changes → %ΔEPS > %ΔP → P/E falls ↓
  - o Adding debt, makes $1 of earnings riskier → P/E ↓
- Share price as a function of D/(D+E) increasing is ambiguous
  - o EPS ↑
  - o K_E ↑
  - o Net effect is ambiguous (see graph)

o	Rest of the industry

- Too much debt → ratings downgrades, covenant violations, vulnerability to competitive attack
- Too little debt → not maximizing the stock price by taking advantage of tax shields, vulnerability to buyout (using firm's own debt capacity)

Possible Responses to a Takeover Attempt:
• Lever Up
• Increase dividends
• Buy back stock

Uses of Funds – Funds from Operations = External Financing Req.

How can a firm grow faster?
• Increase in Asset Turnover (Sales/Assets ↑)
• Increase in Leverage (D/E ↑)
• Decrease in Dividends (d↓)
• Increase ROE (NI/Sales ↑)
• Sell outside equity (D/E ↓)

- ROTC = return on total capital
- TRSH = total return to shareholders

- β↑ as D/(D+E) ↑ because risk ↑ → adding leverage makes equity more volatile
  - o Note that as β↑ → k_E ↑ (see graph)

$$TRSH = ROTC \times E + [(ROTC \times D) - (k_D \times D)]$$
$$= ROTC \times TC - (k_D \times D)$$

- TRSH is the return on total capital less the cost of debt → equity holders get the residual return on total capital once the cost of debt is covered

$$WACC = k_D(1-t)\left(\frac{D}{D+E}\right) + k_E\left(\frac{E}{D+E}\right)$$

$$ROE = ROTC + (ROTC - k_D)\left(\frac{D}{E}\right)$$

- Net effect on WACC:
  - o Goes down because of the tax shield benefits of debt
  - o Goes back up again because of the potential costs of financial distress (agency costs, bankruptcy costs, supplier risk, market share vulnerability, etc.)

Generally, cash into the company is a good sign and cash out of the company is a bad sign.

Cash is the ultimate credible signal.

Optimal Capital Structure: The combination of debt and equity that minimizes the weighted average cost of capital, given the risk of the firm, in its industry and at that point in time. The stock price is maximized, ceteris paribus, when the WACC is minimized (in the same way that I can maximize the stock price for any dimension of operations, if I can minimize a cost there). (see graph)

Firms are reluctant to issue equity, preferring:

- Internally generated funds 60%
- Debt 24%
- Accounts payable 12%
- Equity issues 4%

Why are firms reluctant to issue equity?

- Importance of financial slack (excess debt capacity)
- Gives power to sustainable growth
- Importance of external capital markets
- Increased importance to debt ratio (access to capital markets)
- There exist costs to false signaling
- All general rules-of-thumb → conclusion not to issue equity early

Determining the optimal capital structure:
• Internal analysis
o Preferences
o Assessment of access to capital now and in the future
o Pro formas
o Cash flows
o In the worst case, can I pay off my debt?
• External analysis
o Ratings agencies
o Analysts
o Bank relationships
• Cross-sectional

The Pecking Order Hypothesis: Straying from the static MM equilibrium, firms rely on (in order of preference):
• Internally generated funds
• Issuing debt (not an asymmetric signal since firm risks bankruptcy)
• Issuing equity

Target capital structure and optimal capital structure are often very different. The optimal capital structure is the MM capital structure that

maximizes the stock price by minimizing the WACC. The target capital structure is the capital structure that the firm intends to maintain.

- Capital structure is determined in practice a lot by internal funds and profitability → profitable firms have less debt
- Internal and external capital markets are very different
- CFO's objectives may possibly be in conflict (e.g. doing all positive NPV projects and not issuing equity) → tradeoffs

Convertible Bonds:

- Less of a price hit than if issued equity (where the asymmetric information problem makes it difficult to distinguish good firms from bad firms)
- Much more difficult to under-perform with debt → no negative signal to issuing debt
- Convertibles are switched to equity if firm does well enough
- Best firms with positive NPV and cash flow → issue debt
- Good firms with positive NPV and low cash flow → convertibles
- Troubled firms → issue equity

WORKING CAPITAL

Extra inventory is only a funding problem.

- It does not show up in the P/L until the firm writes it off as an extraordinary item (if it is inventory the firm cannot sell)

The production function is f(Labor, Materials)

- The income statement only reflects the COGS, not the cost of goods produced
- Goods which are produced and not sold are capitalized as inventory

Framework for approaching working capital problems:

- Compare pro-formas to actual, realized outcome and assess where things are breaking down, if there are any problems
- Develop a sources and uses of funds statement to assess where funds are being used and sourced out of alignment with the original forecast

	Increase	Decrease
Assets	Use of Funds	Source of Funds
Liabilities	Source of Funds	Use of Funds

- When doing pro-formas, it will be necessary to make assumptions about the evolution of the following financial statement items (at least):
  - A/R ← Look at Days Receivable
  - A/P ← Look at Days Payable
  - Tax Rate ← Look at historic taxes paid
  - SG&A ← Look at historic percentage of sales, or constant
  - Sales growth ← per economics of business
  - COGS ← as a percentage of sales, with any savings factored in
  - EPS → look at growth in EPS to see if it is consistent with economics of business
  - Use Cash and STD as 'plugs'
- Non-cash net working capital consists of current assets (less cash) less current liabilities (not counting short-term debt or other interest-bearing obligations)
- See how the non-cash net working capital is financed with short-term debt and with long-term debt and equity → determine its sustainability

SUSTAINABLE GROWTH

The following must be consistent:

$$g* = ROE \times (1-d)$$

$$ROE \leq ROTA \times \frac{TA}{NW}$$

How to deal with shortfalls in financial targets (i.e. when growing faster than sustainable growth rate):

- Do nothing → leverage increases → ratings downgraded
- Improve ROTA → tough if already at upper limit of effectiveness
- Cut dividends → could be inconsistent with other goals
- Slow growth down → could be inconsistent with other goals
- Issue equity → possible negative signal to marketplace

The challenge is to make growth and profitability consistent.

COST OF CAPITAL

What discount rate should we use in valuing projects?

- Reflect the riskiness of the cash flows
- Discount rate should be equal to the cost of capital flow
- WACC applies to the Free Cash Flows of the Firm, reflecting the cost of debt and equity (assuming a constant risk level)

$$WACC = (\%D)(1-t)k_D + (\%E)k_E$$

- Use CAPM to get k_E

$$k_E = r_f + \beta(r_m - r_f)$$

  - Unlever each comparable's β_E at the comparable's market D/(D+E) to get the comparable's β_A

$$\beta_A^{Comparable} = \beta_E^{Comparable} \times \left(\frac{E}{D+E} \right)$$

  - Average all of the comparable's β_A's to get the estimated project β_A

$$\beta_A^{Project} = \sum_{Comparables} \frac{\beta_A^{Comparable}}{\# \ of \ Comparables}$$

  - Relever the project's estimated β_A using the project's **target** D/(D+E) to get the project's β_E

$$\beta_E^{Project} = \beta_A^{Project} \left(\frac{D+E}{E} \right)$$

  - Use the project's β_E to get the cost of equity from CAPM

- Alternatively, there is the Dividend Discount model:

$$k_E = \frac{D}{P} + g$$

- In valuing a project, we want to use the:
  - β of the project
  - The project's cash flows
  - The project's cost of capital
  - The project's capital structure

VictoryRisk

- **Do not apply a single cost of capital across projects within a firm. Use divisional costs of capital, if necessary.**
- To find the β:
  - Twin firm: Look at the β of an other project with the same product risk and the same leverage (or unlever and relever, if necessary)

Unlevering β:

- We want to capture the riskiness of the assets (i.e. its product risk) in isolation from its financial risk

$$\beta_{Assets} = (\%D)\beta_{Debt} + (\%E)\beta_{Equity} = (\%E)\beta_{Equity}$$

- **This is the market value of debt and the market value of equity**
- Assume that β_{Debt} is equal to zero
  - AAA β_{Debt} is 0.15
  - Junk β_{Debt} is 0.60
- Substituting β_{Debt} equal to 0, we obtain the following equation (in which β_{Assets} and $\beta_{Unlevered}$ are terms that are used interchangeably)

$$\beta_{Unlevered} = \beta_{Equity} \times \frac{E}{D+E} = \frac{\beta_{Equity}}{\left(1+\dfrac{D}{E}\right)}$$

- **Unlever at market levels of debt and equity and relever at target**
- Note that when we unlever and relever, we assume that k_E is a straight-line function of D/E (leverage)(see graph below)

- This is only true for small changes in D/E because of the true curvature in the relationship → our estimates will be incorrect by a large amount for large changes in leverage (D/E)
- Notice that the unlevered β assumes a no-tax world, but we could have incorporated taxes in a different manner (although this technique is not commonly employed)

$$\beta_{Unlevered} = \frac{\beta_{Equity}}{\left(1+\dfrac{(1-t)D}{E}\right)}$$

RELEVER WITH TARGET D/E

- **Do not confuse execution financing with target financing**
  - Target financing is what the firm maintains in the long run, when they are running the project
  - Execution financing is the way in which the deal takes place (e.g. 100% equity, to be subsequently levered up)
- **Key assumptions:**
  - r_f = Long-term Treasury Yield – 1%
    - Contrived estimate of future T-Bill rates
    - We want the T-Bill rate since the market risk premium (r_m-r_f) is based on T-Bill rates
    - 1% reflects the liquidity premium
  - Market risk premium r_m-r_f is 8.8%
    - Historical average since 1926

- Arithmetic mean used to calculate it
- A geometric mean would be necessarily smaller (on or about 5 to 6%) → this is a compound return
- The difference between an arithmetic mean and a geometric mean is induced by volatility
  - If there were no volatility → the two means would be the same
- Use the arithmetic mean since it is greater
  - We would accept more projects if we used the geometric mean because it leads to a lower discount rate
  - Using the higher discount rate gives the valuation a margin of error

VALUATION

Five Ways to Value A Firm: (A Family of Techniques)

- Earnings Multiples (P/E, EBIT, EBIAT, EBITDA, CF, Rev., etc.)
- Asset Multiples (Assets, MV/BV, Liquidation, Replacement)
- Discounted Cash Flow (FCFF, FCFE, APV, EVA)
- Comparables (Per bbl, per acre, etc.)
- Contingent Claims (real options)

Basis of DCF Analysis:

Total Assets
- Current Liabilities
+ ST Interest Bearing Liabilities
= Net Assets

Net Working Capital
+ PP&E
+ Other Assets
= Net Assets

Value Net Assets = Value of the Firm = Value of Debt + Value of Equity

A	Liability + NW
	FCFD
	FCFE
FCFF	FCFE+FCFD – t(Interest Payments)

- **FCFF ≠ FCFE + FCFD** because of the effect of the tax shield of debt
- **Discount rate picks up systematic risk. Specific risk should be picked up in the cash flows**

> EBIT (1-t)
> + Depreciation
> + Amortization
> - CapEx
> - Increase in W/C
> <u>+ Extras</u>
> = FCFF

- Free Cash Flow to the Firm (FCFF) is the cash flow that is left over after operations and investment requirements are taken care of. The value of the firm is the discounted present value of these cash flows, in the sense that this is the value added created in any period.
- FCFF can be laid claim to by debt-holders or equity-holders, depending upon the capital structure of the firm.
- **The extra cash flow from an extra D in depreciation is equal to tD:**
- Increase depreciation by D → EBIT(1-t) falls by D(1-t)=D-tD
- CF up by D (from the add-back of non-cash charges)
- Net effect of depreciation: D-D(1-t)=tD

Important to think about NOLs: **NOLs may be counted against debt since the cash tax savings can be used to pay down debt**

VictoryRisk

Free Cash Flow to the Firm and Free Cash Flow to Equity

        EBIT(1-t)

        + Depreciation

        + Amortization

        - CapEx

        - Increase in W/C

        <u>+ Extras</u>

        = FCFF

        Interest Payments

        <u>+ Debt Repayments</u>

        = FCFD

$PPE_{EB} = PPE_{BB}+CAPX-Depr.$
$\Delta\ PPE = CAPX - Depr.$
$V\ Firm = V\ Equity + V\ Debt$
$Stock\ Price = (V\ Equity)/\#Sh$
$NWC = ST\ Assets - ST\ Liab$
$NA = TA - Goodwill - Non\text{-}Int.\ Liab.$
$EVA = EBIT(1\text{-}t) - kNA$

        NI

        + Depreciation

        + Amortization

        - CapEx

        - Increase in W/C

        + Extras

        <u>- Debt Repayments</u>

        = FCFE

NI + I(1-t) = EBIT(1-t) --> NI = (1-t)(EBIT-I) = (1-t)(EBT)
FCFE + I(1-t) + Debt Repayments = FCFF
FCFE + FCFD - tI = FCFF

        FCFF (Discounted at the WACC)

        - Purchase Price

        + PV FCFF

        + PV TV

        = NPV Transaction

        PV FCFF

        + PV TV

        - PV Debt

        = PV Equity

        FCFE (Discounted at k_E)

        PV FCFE

        + PV TV

        = PV Equity

APV (Valuing the company as if it were 100% equity financed)

- Unlever each comparable's β_E to estimate its β_A
- Use the average of all of the comparables' β_A to find the project's β_A
- Use the project's estimated β_A to calculate the project's all-equity k_A, using the CAPM model
- Discount all the FCFF and the TV using the project's k_A
- Add the PV of the Tax Shield of Debt
  - Separate interest-bearing debt into its respective tranches
  - Calculate the tax shield by tranche for each year and discount by the tranche's yield-to-maturity (reflective of the risk in that tranche)

$$V_{Tax\ Shield\ in\ Year\ i} = t\times Average\ Balance\times Interest\ Rate$$

  - Use the average balance over the year (especially if a tranche is being paid down quickly) – calculated by amortization/time value of money methods
  - If debt is longer than 10-15 years, value the tax shields as if they were a perpetuity

$$TV\ Perpetuity = \frac{V_{Final\ Tax\ Shield}(1+ g_{Tax\ Shield})}{YTM - g_{Tax\ Shield}}$$

  - Add up the PV's across tranches

Terminal Value Calculation:

- Liquidation Value (best for low growth firms)

  Liquidation - Book Value

      NWC
      + PP&E
      + Goodwill
      + OA
      = Book Value TV

  Liquidation - Net Worth

      Total NA
      - Total Liabilities
      = Net Worth TV

- Perpetuity (best for stable cash generating firms)

$$Perpetuity_{Firm} = \frac{FCF_F(1+g)}{WACC - g}$$

$$Perpetuity_{Equity} = \frac{FCF_E(1+g)}{k_E - g}$$

- Multiples (best for high growth firms)

$$TV_{Earnings} = \left(Multiple_{Project}\times Earnings\right)-Taxes$$

$$Unlevered\ Multiple = \frac{V_{Debt} + V_{Equity}}{EBIAT}$$

- Determine multiple of EBIAT (or whatever metric) at which comparables trade and apply to the own project EBIAT (or suitable metric)

$$Multiple_{Comp} = \frac{(MV_{Equity} + MV_{Debt})}{EBIAT}$$

- Average multiples across comparables → Project multiple

- The unlevered multiple uses EBIAT → giving both a debt and equity-relevant multiple

Will a firm sell above or below its BV?

- If ROTC < WACC → sells below BV of firm
- If ROTC > WACC → sells above BV of firm
- If ROE > k_E → sells above BV of equity (EVA)
- If ROE < k_E → sells below BV of equity (EVA)

Breakeven Growth Rate: The growth rate that makes NPV equal to zero.

Things to do with bad management (as a shareholder):

- Takeover
- Proxy fight
- Lobby directors
- Litigation

In a takeover, **speed is of the essence.**

- Litigation slows them down in a takeover
- Sue for misleading proxy statements
- Slowing down gives shareholders time to get the stock price up

Transfer agent: a third party collecting proxies

How does an incorrectly priced asset correct itself?

1. Is everyone rational? No
2. If the stock is overvalued --> the smart money shorts the stock

If the stock is overpriced:

- Sell as much of it as possible
- Second-best solution is to merge using the equity as the currency

Deal potential:

- New industry
- Small public float
- Big growth rate (extrapolated forever)

LEVERAGED BUY OUT

A WACC approach is inappropriate because of the high leverage.

The **perfect LBO** would include the following:
• Target had debt capacity to use
• Target had assets to write up (pre-1987)
• Target had stable cash flow (in a safe product market)
• LBO team had good management on its side
• The target had separable pieces that could be sold off in time of distress
• There was a single investor

• The incentives of debt-holders and equity holders were aligned (strip finance)
• Target was valued attractively

LBO: Use the target firm's assets or debt capacity (or both) to borrow in order to take the firm private.

- An efficient tax shield correctly manages the tradeoff between the costs of financial distress and the tax shield

Strip Financing: A non-separable strip of different securities (debt and equity) held by the agents financing the LBO transaction, aligning their incentives and risks

- Strip debt holders will not force the firm into bankruptcy because they are also equity holders
- Strip financing mitigates the tradeoff between the costs of financial distress and the tax shield, leaving us only worried about the debt that might forces us into bankruptcy

Much of the value created in LBOs comes from tax-related savings:

- Depreciation (if assets are written up in the purchase)
- Interest deductibility from a higher debt load

Essentially, the firm is paying to its owners money that it used to pay to the government.

- **If tax savings are the motivation for the LBO, then the firm should go public again once the depreciation and interest tax shields are used up.**

Value of an LBO:

- Step-up in assets (gone in 1987)
- Extra interest deduction
- Changed incentives for management
- Use of strip finance to align incentives of stakeholders

Why did the LBO market sour in the late 1980s and the early 1990s?

- Repealed and changed laws (e.g. tax reform)
- Prices were bid up
- Too much money chasing too few deals
- Structural changes in the LBO market (e.g. move away from strip finance)

The **overheated buyout market hypothesis (Kaplan and Stein)**:

- The success of early deals attracted a large inflow of new money --> too much money chasing too few deals --> overpricing, reckless structuring
- Hypothesis: Demand push from junk bond markets in late 1980s --> higher prices and greater risks of financial distress than earlier deals
  - Buyout price-to-cash flow ratios rose, though not more sharply than market wide or industry wide ratios
  - Prices were higher in deals financed with junk
  - As prices rose, buyouts take place in increasingly risky industries and with higher leverage
  - Later deals involved banks less, accelerated required principal repayments --> lower cash flow-to-obligation ratios
  - Public junk replaced private subordinated debt and strip finance
  - Management and advisors took more money up front
- Alternative hypothesis: Increased liquidity for asset sales might make junk financing more attractive or easier to execute
- Junk deals have more publicly dispersed creditors --> less flexibility

LEVERAGED RECAPITALIZATION

Definition: (Sometimes called a public LBO) The act of levering up the firm and using the proceeds to buy back outstanding shares

LBO	Leveraged Recap
Private firm	Public firm

More leverage than recap	Less leverage than LBO
Management control ~ 15%	Management control ~ 30%
Sale of a company	Merger
Always a capital gain if there is a tender of shares	Cash distribution in a recap is a capital gain if current shareholder ownership < 80% of old ownership, stockholder-by-stockholder (otherwise it constitutes a change of control)

A WACC approach is inappropriate because of the high leverage.

In LBOs and Leveraged Recaps, P/Es are inappropriate because of the leverage. EBIT multiples are much more stable. P/Es will change with leverage.

Leveraged Recap Example:

- Stub $30
- Cash $50
- Old Basis $50
- Debentures $0
- Assume that this meets the 80% test → capital gains treatment
- ∴ CG = Stub + Cash + Debenture – Old Basis = 30+50+0-50=30
- New Tax Basis = Old Tax Basis + Capital Gain – Cash – Debenture
    - NB = 50+30-50-0 = 30
- **If this had been dividend treatment and not capital gains treatment:**
    - Assume sold stub for $30 and Old Basis of $50
    - Pay ordinary income tax on $50 cash
    - Capital Loss = Stub – Old Basis = 30 – 50 = (20)
- If 80% treatment and CG → CG on $30 and new basis of $30
- If not CG treatment → Ordinary income tax on $50 cash and capital loss of $20

LBOs and Leveraged Recaps are usually designed so that the FCFE is equal to zero. All intermediate cash flows go to debt repayment and all value is located in the terminal value.

Why are pension funds so important?

- Don't pay them cash
- Usually vote with management
- Enable the 80% treatment for others since they are tax-exempt (will take cash instead of stub → changing the equity ownership post facto)

Management:

- Sells old shares → capital gains
- Receives new shares without being affected by the 80% rule
- Ups % of ownership

MERGERS AND ACQUISITIONS

Change creates deal opportunities.

Framework:
• **Strategy**
• **Valuation**
• **Execution**

Sources of Value:

- Monopoly power/market power (e.g. Standard Oil)
    - Anti-trust problematic
- Economies of scale/Real synergies → lower cost
- Financial synergies → requires proper capital structure
    - Less likely (indicative of managerial failure)
- Regulatory or Economic change
- Transfer from other claim holders (e.g. government, unions)

- Uncommon
- Managerial discretion → fire the management team and reduce agency problem
    - Common
- Undervalued target or overvalued acquirer
    - Not common

You can break out the FCF by piece (i.e. by division) with the objective of isolating uneconomic activities that can be discarded.

One way to quantify value may to be to value the better operating margin as a perpetuity, assuming some growth, and discounting it at the k_E.

How do you attack a firm?

- Buy shares ahead of time
    - At 5%, must disclose ("toehold investor") within 10 business days
    - At 10%, you become a constructive insider and your ability to sell is restricted
- If you want to own it all, buy as many shares as possible before having to disclose
    - 15-20% may be considered to be a running start

How do you defend a firm?

- Get the share price up
    - Buyback
    - Increased dividends
    - White knight
    - LBO
- Government
- Pac Man: buy the putative acquirer
- Poison Pill
    - Originally, target firm shareholders acquires shares in bidding firm
    - Then became, target firm shareholders acquires shares in self
    - Acquires can get around this by making any tender contingent upon pill being vitiated
    - **Flip-in Pill:** If someone acquires more than 20% of you, flip-in pill becomes exercisable into acquiring firm's stock

RISK MANAGEMENT

Key question: What effect does hedging (or not hedging) have on the firm's investment decision-making?

Types of corporate risk exposure:

- Exchange rates
- Interest rates
- Commodity prices
- **Anything that affects the firm differently than its competitors**

Why hedge?

- If the benefits of hedging exceed the cost of hedging
- Think of the hedging the value of the firm or the firm's cash flows
    - Hedging cash flows means that the firm will be able to continue to operate in adverse scenarios
- Hedging fully is expensive → at some point the marginal costs of hedging outweigh the marginal benefits of hedging

Modigliani-Miller on hedging: Unless hedging affects cash flow, it should not make a difference to the value of the firm (investors can hedge on their own)

- Asymmetric access to markets –-> investors may not be able to hedge on their own, or as efficiently
- Positive cost of financial distress → may suggest a value for hedging cash flows in order to mitigate the cost of financial distress
- Tax smoothing and progressive corporate tax rates → hedging may make sense from a tax perspective
- Internal funds are cheaper than external funds → being able to preserve internally generated funds has benefits in terms of reducing financing costs

Implementation:

- Which risks (translation, operating, transaction)?
- Near term or longer term?
- Which instruments?

Possible rationales for managing operating risks:

Value Hedge
• Mitigate managers' or stockholders' own risks
• Manage accounting numbers and expectations
• Reduce tax liabilities → smoothing
• Reduce costs of financial distress → increased debt capacity
• Coordinate investment and financing policies (so that the firm **has enough cash to do good investments**)
• The preference for internal funds over external funds
Cash Flow Hedge

In perfect markets, hedging does not add value:

- The capital markets will provide extra funds when needed and value hedging is equivalent to cash flow hedging
  - No hedge → raise outside funds in bad state
  - Hedge → hedge loses in good state, offset by CF surplus

In imperfect markets, hedging adds value:

- Investment funds may be less available in the bad state → value for hedging if it allows the firm to pursue good investments in the bad state
- Value hedging and cash flow hedging can be different in imperfect markets
- Hedge effectively sources funds in the bad state and sells off excess cash flow in the good state → smoothing requirements in a way that enables the firm to guarantee pursuit of good investments
- **Natural hedges** may reduce the need for financial hedges and may introduce a wedge between value hedging and cash flow hedging
  - Hedging with changing investment opportunities (e.g. where investment opportunities are contingent upon the state of the world)
  - Hedging with changing financing opportunities (e.g. when debt capacity is a function of the state of the world)
  -

Exchange rate hedging:

- Objective: to protect investment opportunities that may be denominated in several different currencies
  - How sensitive are the revenues from potential foreign investments to exchange rates?
  - How sensitive are the costs of foreign investments to the exchange rate?

Implementation:

- Compare pre-hedge cash flows with different states of the world
- Determine net CF exposure profile (i.e. net of investment)
- Choose type and quantity of instruments to supplement CFs in adverse states of the world
- Construct the hedge to insulate post-hedge net CFs
- Use instruments to match cash flows with investment needs exactly
  - Tradeoff: Non-linear payoffs → non-linear hedges (balanced against cost)
  - Beware mark-to-market cash flow implications of futures contracts
- Must worry about competitor hedges

PROJECT FINANCE

Definition: A large capital investment project, involving a discrete asset, financed on a stand-alone basis. Usual features include:

- Discrete assets that are difficult to move or shut down --> risk
- Fixed large investment, upfront --> risk
- Capable of running as a standalone entity
- Complex contracting structure, costly to negotiate --> allocation of risk
- Risks usually allocated to many parties
- Very large
- Foreign investment

The purpose of project finance is to shift and to reduce the burden of risk.

- Shift risk from the parent to a party who can bear it more cheaply than the parent (or who is willing, for possibly non-pecuniary reasons, to bear it)
- Ex: Non-recourse financing

Different types of risk in projects:

- Development risk:
  - Technology risk
  - Resource risk
  - Completion risk
- Cash flow risks:
  - Operating risk (cost over-runs)
  - Throughput risk (e.g. pipeline without sufficient oil)
    - Before building, sign long-term throughput (or tolling) agreements
  - Market risk (price risk, volume risk)
    - Fixed, long-term contracts lock-in prices
- Act of God
- Political risk
  - Expropriation risk:
    - Low while investing and building
    - High when completed, especially if lucrative project
    - Borrowing from local banks or from those with leverage with the government is one way to mitigate this risk
  - Taxation risk

Valuation:

- Typical to use a FCFE or an APV and not a WACC
  - Usually subsidized debt
  - Usually dynamic leverage
- WACC assumes a constant debt/equity, constant risk level and that k_D and k_E are market levels
- Also customary to get the k_E using an IRR
- Picking up the risk in the project can either occur in the cash flows or in the discount rate:
  - **Discount rate picks up systematic risk**
  - **Country risk premium:** In practice, take k + cost of country
    - Not academically correct to do this
    - Extra risk of default should be picked up in the riskiness of the cash flows
  - **Specific risk should be picked up in the cash flow using a range of sensitivities**

In practice, in project finance:
• **Take the expected CF**
• **Do the IRR for the project**
• **Compare the IRR to a hurdle rate**

FINANCIAL DISTRESS

Anatomy (Asquith, Gertner and Scharfstein):

- Firms can become financially distressed for three reasons:
  - High interest expense
  - Poor operating performance relative to other companies in the industry (most important factor)
  - An industry downturn
- Study of junk-bond issuers
- Firms can restructure balance sheets on either the asset side (selling assets, reducing CapEx) or on the liabilities and equity side (restructuring debt and equity)

- Private debt:
  - Typically a callable, revolving credit facility with a bank
  - More than half of it is secured
  - Restructurings triggered by default or covenant violation
  - Banks often choose to restructure rather than to call
- Public debt:
  - Typically subordinate to private debt
  - Typically unsecured
  - Secured public debt has only a second or third lien on the firm's assets, behind that of private lenders
- Types of private debt restructuring:
  - Banks loosen by deferring principal and interest payments, providing new loans and waiving covenants
    - More prone to loosening when they have collateral
    - May loosen (by providing new loans) in order to get collateral on ex ante loans
    - Loosening does not reduce the probability of bankruptcy, in practice
  - Banks never loosen by forgiving principal
    - No incentive given that the bank's claims would not be impaired in bankruptcy (seniority and security)
  - Banks tighten by accelerating principal and interest payments, reducing lines of credit and increasing collateral
  - Banks do both
  - Banks do nothing
- Factors in the private debt restructuring decision:
  - **The firm's economic viability**: Reducing a line of credit may reduce the agency problem, for example
  - **Debt overhang problems**: It is difficult to raise capital when some of the proceeds go to pay off existing creditors
    - If unsecured, less likely to restructure bank debt
- Types of public debt restructuring:
  - Exchange offer: Exchange a package of securities and cash for their outstanding public debt
- Empirically, public debt restructuring:
  - Companies in distress that do not restructure --> bankruptcy
  - Theoretically, exchanges are made difficult by the free-rider problem of the holdout investor
    - The holdout problem can be mitigated by structure the exchange to offer debt-holders more senior securities or cash if they exchange --> free-riders are left with more junior securities than they had before
  - Offer usually contingent on a minimum fraction of the debt
  - **Trust and Indenture Act of 1939:** Prohibits any voting mechanism (except unanimity) to alter the interest and principal payments of public debt
    - Only allowed to make individual agreements with debt-holders or tender offers that exchange old debt for new securities
  - Even if a firm restructures its public debt, banks make only minor concessions
- Asset sales:
  - Limited by industry factors: If industry is in distress, then asset sales less likely because of lower prices for assets at sale
- Firms in financial distress reduce CapEx aggressively
- **The structure of a company's liabilities affects the likelihood that it goes bankrupt**
  - Companies with more secured private debt as well as companies with more complex public debt structures are more prone to seek bankruptcy protection
  - The collateral that protects banks in Chapter 11 seems to make them more accommodating early in the restructuring process, but also more prone to force bankruptcy
- Once in distress, firms with higher operating income, lower book-to-market equity ratios and higher cash flow coverage are as likely to go bankrupt, sell assets or cut capital expenditures as other firms

Bankruptcy:

- Chapter 7: Liquidation

- Chapter 11: Protection from creditors under the auspices of the bankruptcy court, during which time the business can be restructured
  - Objective: Reduce the value of the debt to less than the value of the firm so that the firm can continue as a going concern
  - Expensive:
    - Fees (millions of dollars per month, potentially)
    - Management time and attention
    - Uncertain: Others may file reorganization plans
  - Gives firm 120 day exclusivity period during which they are the only ones who can file a bankruptcy plan (typically this period is extended)
- Pre-pack (S.1126B – Bankruptcy Act): A pre-packaged bankruptcy in which a solution is negotiated and then it is cemented in an accelerated Chapter 11 proceeding
- Voluntary renegotiation has two problems (both of which are solved in bankruptcy):
  - The holdout investor free-rider problem: For every creditor who does not exchange, the value of their claims is improved whenever another creditor does agree to exchange
    - Trust and Indenture Act of 1939 prevents two-tiered offers (i.e. high price to early acceptors and late people get left out)
    - Getting around the holdout problem:
      - Make exchange more senior to ex ante debt
      - Make exchanged debt shorter maturity than ex ante debt
      - If old debt is senior, use exit consents to strip the covenants
        - If you can get a 2/3 vote of creditors for old bond (depending on the indenture), you can typically change the covenants
        - Percentage of vote may vary with issue (51% so-called Trap Doors)
      - Reduce assets
        - Sell most liquid assets by giving cash as part of the exchange
      - Make exchange contingent on a high percentage of acceptance
      - Warfare: Stop making markets in old debt
      - File a Form 15 (SEC): If you are a private firm and you have under 300 debt holders --> no longer require the filing of financial statements with the SEC and with debt holders
  - Taxes to company: Cancellation of indebtedness (S.108) --> A company that writes down a debt must report the amount of the write-down as income immediately
    - May have NOLs elsewhere to set against this deemed income
    - Insolvency exception: Get around this (but cannot use NOLs, though)
    - Stock-for-debt exception (S. 382): Also affects use of NOLs
    - S.1274A Exception: Exchanging securities for securities - cancellation of debt income becomes amortizable over the life of the security into which it is exchanged

Exchanges:

- Easier the fewer the holders and the fewer the classes of debt
- Resets make restructuring very difficult (floating rate)
- Easier for an outsider to force the restructuring than an insider

Junk market:

- Aging
- Survivorship bias