

Capital Structure II

Corporate Finance and Incentives

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- The firm's mix of debt and equity financing is called capital structure
- Modigliani & Miller - irrelevance of capital structure under the following assumptions
 - Perfect capital markets
 - No taxes
 - Costless bankruptcy

Value of levered firm = value of unlevered firm

Value of levered firm = value of unlevered firm + PV(taxshield)

- Personal taxes
 - Preferential taxation of equity distributions reduce value of interest tax shield
- Inability to use tax shield
 - reduces effective tax shield
- Costs of financial distress
 - probability of financial distress increases with higher leverage ratio

Tradeoff theory

- Relaxing the assumption of bankruptcy proceedings being costless
- Baxter (1967) was the first to introduce bankruptcy costs
- Hence, the tradeoff of leverage consists of the tax shield associated with issuing debt versus the increased probability of defaulting and thus the increased bankruptcy probability/costs

$$\text{Value of levered firm} = \text{value of unlevered firm} + PV(\text{taxshield}) - PV(\text{costs of financial distress})$$

- Bankruptcy occurs when the stockholders exercise their right to default.
- Stockholders have limited liability - when the company gets into trouble, the stockholders can just walk away and leave the companies assets to the creditors.
- The bondholders become the new stockholders

Components of bankruptcy costs

- Direct costs:
 - Legal fees, accounting fees, administrative costs, etc.
- Indirect costs (costs of financial distress):
 - Bondholder-shareholder issues
 - Having to forego positive NPV investment projects, because of insufficient funds
 - Finding it hard to conduct business
 - Unable to maintain trade credits, clients, etc.

- Idea: The different agents' payoff varies which implies that while one action may benefit one part, it may be unwanted by another
- In order to properly understand this we must explore the payoff structure of the various claims
- Option theory provides powerful insights

Debtholder - shareholder conflicts

- The Asset Substitution Problem
 - Excessive risk
- The Debt Overhang Problem
 - Under investment
- The Shortsighted Investment Problem
 - Investing in short-termed less favorable investment projects
- The Reluctance to liquidate Problem
 - Prolonging bankruptcy proceedings
- Claims dilution and dividend payments
- Generally speaking:
 - Incentives of equity holders to maximize the value of shares are not necessarily consistent with the incentive to maximize the total value of the firm

The asset substitution problem

- From viewing corporate securities as options we saw that:
- Equity = call option on the assets of the company
- Debt = combination of a riskless position and a short position in a put on the assets of the company
- Hence, increasing the risk adds value to the shareholders' claim, which, however, comes at the expense of the bondholders

The asset substitution problem

- Rational bondholders realize the incentive for shareholders to take on excessive risk
- Hence, they will demand a higher premium, which in turn renders some previously positive NPV investment projects impossible to finance if the shareholders cannot credibly commit to the investment project
- Alternatively, they can try to protect themselves by including restrictions in the debt contract

Debt overhang problem

- Selecting projects with positive net present values can at times reduce the value of a levered firm's stock
 - The firms existing debtholders capture most of the benefits
- Since the stockholders are the owners of the company, they may pass up profitable projects which do not add value to the stockholders specifically

Shortsighted investment problem

- High leverage results in high fixed interest payments
- Company owners may choose projects with high shortsighted payoffs in order to be able to service the debt and avoid issuing new debt, which would require higher rates on return due to the higher risk of the company

- Chapter 7 bankruptcy
 - A trustee is appointed to liquidate the company and award the proceeds to the investors according to the absolute priority rule (is only enacted as a last resort)
- Chapter 11 bankruptcy
 - While in chapter 11, the company is exempt from servicing its debts. Management has 120 days to propose a restructuring plan for the company and even has the possibility to have the period extended
 - Acts as a haven (sorting mechanism) to ensure that only inefficient/unprofitable companies are liquidated
 - Possibly grants too much slack to companies.
 - However, does have attributes, amongst others, it facilitates debt relief, since a 2/3 majority can change the terms of the debt contract

The reluctance to liquidate

- Shareholders will never choose to liquidate the company voluntarily
 - Easily realized by using option theory:
 - Liquidating is like exercising the option. As we previously examined American call options on non-dividend paying stock are never exercised prematurely. This is especially true when a company is in financial distress
 - Intuition: A call option on the assets of a financially distressed firm – i.e. an insolvent firm or close to insolvency – contains little or no intrinsic value, but only time value. If the company is liquidated – i.e. the option is exercised – the time value is lost

- The advantage of debt consists of its preferential treatment when the proceeds of the company are split amongst the claimholders in bankruptcy liquidation
- Therefore, any change in the seniority of the debt will have a direct effect on its value.
- Altman and Arman (2002) found that while the recovery rate for senior debt is approximately 57%, it only amounts to 32% for subordinate debt

Paying out large dividends

- Black (1976), “there is no easier way for a company to escape the burden of debt than to pay out all of its assets in the form of a dividend, leaving the creditors holding an empty shell”
 - Outright abuse is prevented by law, but unless covenants exist, management has quite loose reins on the size of the dividend payments
- Paying out dividends reduces the equity of the company, which implies that the probability of the company defaulting on its obligations increases
 - Hence, paying out large dividends work like asset substitution and claim dilution in that it transfers additional risk to the creditors, which lowers the value of their claim

- Restrictions on issuing additional debt
 - Negative pledge – aka the “me first” clause – restricts the issuance of more senior debt
 - Restrictions on a maximum debt-to-equity ratio or a minimum EBITDA-to-Interest ratio
- Other restrictions
 - Restricting asset sales unless proceeds are used to payoff debt
 - Restricting dividends
 - Poison pills & poison puts– restricting takeovers

Mitigating the bondholder-shareholder problem

- Protective covenants – already discussed
- Bank and privately placed debt
 - Helps to alleviate debt overhang & asset substitution
 - More monitoring implies that covenants are more likely to be enforced
 - Concentrated ownership of debt implies that free riding is less likely to occur and that a renegotiation of terms is possible
- Short-term versus long-term debt
 - Short-term implies that shareholders have less options to transfer wealth and it disciplines management (more on this later)
 - However, it aggravates the liquidity problem since debt can be called more quickly

Mitigating the bondholder-shareholder problem

- Security design
 - Using more advanced debt such as convertible bonds limits the possibility to transfer wealth from bondholders to shareholders since bondholders now also share in the upside gain
- Project financing
 - Debt is assigned to a single project/with one purpose in mind. Allows for a more precise evaluation of the risk
 - Rarely possible to separate the investment project

- So far we have looked only at the costs of financial distress stemming from shareholder-debtholder conflicts
- According to the stakeholder theory, these two parties are not the only ones of importance
- Nonfinancial stakeholders also matter
 - Customers
 - Suppliers
 - Employees
 - The overall community

- The stakeholders face costs in the event of financial distress
- These costs will be passed on to the company
 - In the form of a reluctance to do business with the firm
 - Requiring premiums to reduce the stakeholders costs
- This may deter the firm from leveraging even though it appears favorable

Pros and cons of tradeoff theory

- Pros: Accurately predicts why leverage varies in various industries.
 - i.e. why IT-companies are much less leveraged than production companies, etc.
- Cons:
 - Leverage has remained relatively stable over time, despite major tax reforms
 - Inter-industry variations are not accounted for
 - Overestimates the optimal degree of leverage
 - Estimated bankruptcy costs (which, however, are difficult to obtain) seem too low to account for the quite conservative leverage structure observed in practice
 - More advanced dynamic models do exist which help to predict more reasonable results, however, these also omit agency problems which are widely recognized as having an influence on leverage

Predictions of the tradeoff theory

- Indications of companies with low leverage ratios:
 - Illiquid/Intangible assets
 - Growing companies with many investment opportunities
 - Unpredictable cash flows
- Indications of companies with high leverage ratios:
 - Liquid assets
 - Few growth/investment options
 - I.e. companies in mature industries
 - Steady predictable cash flows
 - Companies with these characteristics are also the typical targets of LBOs

The pecking order theory

- Idea: Based on a study by Donaldson (1961) but formalized and named by Myers (1984). Considers how a company acquires the necessary financing:
 - Focus is on the effect of asymmetric information and the signaling effect of interacting with the capital markets. Views the tax advantage of debt as a second order effect
- Pecking order:
 - Companies prefer to finance investments with retained earnings rather than external sources
 - Adapt dividend policy to reflect the future financing need of the company
 - Companies prefer to issue the safest securities first, i.e. they prefer to issue straight debt over convertible debt and only issues equity as a last resort

Rationale for the pecking order theory

- Taxes & transaction costs favor funding new investments with retained earnings
- Raising debt does not require the approval of the board
- Issuing equity conveys negative information to the market
- The debt overhang problem makes equity issuance less attractive for financially distressed companies
- Benefits of the pecking order:
 - Helps to explain why leverage varies within the same industry