

# Lecture IV: Debt and Equity – A First Pass

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Accounting Identity

Ownership Forms

# Accounting Identity

- ▶ Most discussion in financial economics can be broken down into the accounting identity

$$A = L + E \quad (1)$$

- ▶  $A$  - Assets - the total \$ value of the firm.
- ▶  $L$  - Liabilities - the \$ value of the firm's assets claimed by lenders.
- ▶  $E$  - Equity - the \$ value of the firm's assets claimed by the firm's owners.

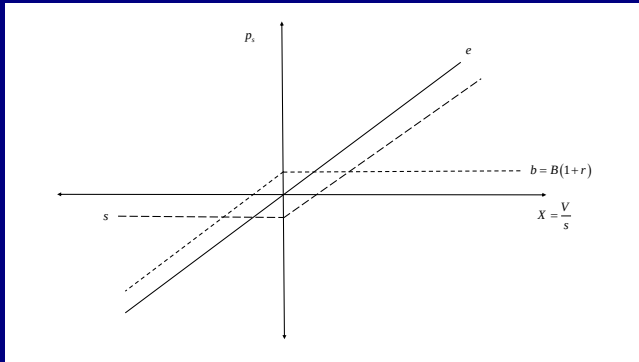
- ▶ Abstracting a little for the point of discussion

$$dA = L + dE \quad (2)$$

the change in asset valuation is "owned" or "claimed" by the equity-holders. The claim on firm asset values from liabilities or debt is fixed by contract – well almost.

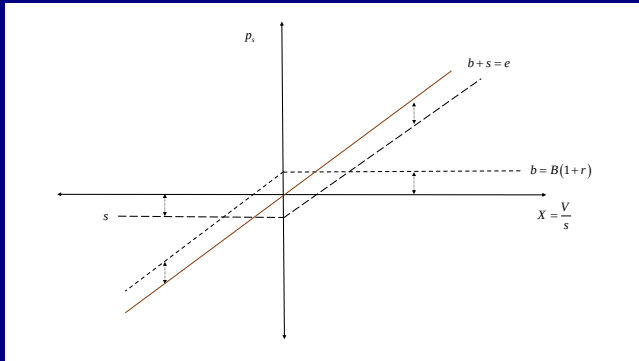
- ▶ The change in the ownership value of the firm can be decomposed as presented in Figure 5.

# Equity and Ownership Claims



- ▶ Items in Figure 5
  - ▶  $X = V/s$  is the market value of the firm's assets normalized by the number of shares.
  - ▶  $p_s$  is the value of the firm's assets per share.
  - ▶  $e$  is the market value of the firm's shares (note that the return on the share cannot be lower than negative of the price paid for the share – the investor can always walk away from his initial investment).
  - ▶  $b$  is the value of debt instrument – if the loan is repaid this amount is  $B(1 + r)$ .
- ▶ As depicted in Figure 7 adding the equity instrument plus the debt instrument yields the original payoff function.

# Capital Market Equilibrium



- ▶ This is essentially the intuition behind Modigliani-Miller – the value of total assets remains the same regardless of how they are financed.
- ▶ The Modigliani-Miller theorem relies on the ability to arbitrage equity and debt. For example, if the interest rate on bonds is too high equity holders (i.e., stockholders) are assumed to sell their stock to buy bonds

$$r_E = \frac{r_A - Lr}{A - L} \Rightarrow r \gg r^*$$

$$\text{Sell stock to buy bonds } dL \ni: A - (L + dL) \ll A - L \quad (3)$$

$$\Rightarrow r_E^* = \frac{r_A - (L + dL)(r + dr)}{A - (L + dL)} \gg r_E.$$

As this happens the price on bonds (i.e., the interest rate) declines until a new equilibrium is reached (as long as  $r_A \ll r$ ).

# Ownership Forms

- ▶ **Sole Proprietorship:** Under this organization the individual directly owns assets that he employs in entrepreneurial activities. In this organization, the owner contracts (i.e., takes out loans and obligates to the delivery of product).
  - ▶ The liabilities and obligations of the firm are also the liabilities and obligations of the individual.
  - ▶ In this way, the proprietor or owner/operator has a claim on any residual - excess of the value of the assets of the firm over its obligations.

- ▶ **Partnership:** Partnerships may exist under a variety of legal frameworks from fairly informal partnerships based on “hand shake agreements” to more elaborate limited liability partnerships.
  - ▶ At the most basic level, a partnership is an agreement linking the interests of two individuals.
  - ▶ The agreement specifies the intent of the collaboration, the expectations of each party, and the claim that each party will have on the proceeds from the collaboration.

- ▶ **Corporation:** A corporation is a legal entity by which a group of individuals collaborate by placing some of their assets at risk (i.e., an investment of a portion of their assets in common stock).
  - ▶ As a legal entity, the corporation may enter into contracts that do not bind the individual owners.
  - ▶ Importantly, the debt of the corporation does not pass to the individuals.
  - ▶ However, the owners of the corporation only have a claim to the assets of the corporation embodied in the terms of their stock.

- ▶ Historically, most farms have been organized as sole proprietorships, depending on debt for additional capital.
- ▶ Following the discussion of Kochhar, two approaches have been developed to describe the capital structure of the firm – Agency Theory and Transaction Costs.
  - ▶ Kochhar, R. 1996. Explaining Firm Capital Structure: The Role of Agency Theory vs. Transaction Cost Economics. *Strategic Management Journal* 17, 713-728.
- 1. Appendix A of the textbook focuses largely on Agency Theory – the differences between the incentives of the Principle that own the assets and the Agent that manages the assets. Most of our initial discussion will be using a model originally proposed by Jensen and Mecklin (1976).
- 2. Transaction Cost Economics focuses on the fact that it may be costly to search for a market partner (either buyer and seller) and once the market partner is located it is costly to establish the terms of the transaction.

- ▶ "Modigliani and Miller (1958) were the first to raise the issue of capital structure. They argued that, under certain conditions, the choice between debt and equity does not affect firm value, and hence, the decision is 'irrelevant'. These conditions included, among others,
  1. assumptions about the absence of taxes,
  2. of negligible transaction costs in the capital market, and
  3. of no information asymmetry between various market players (Kochhar 1996)."
- ▶ "Transaction cost and agency theories share similarities along various dimensions. The notion of opportunism and self-interest is a common dominant assumption.... This behavioral feature, in the presence of uncertainty, leads to conflicts arising from the divergence of goals between contracting parties... (Kochhar 1996)."
- ▶ **"The result is the setup of an efficient contracting mechanism that serves to minimize (agency or transaction) costs"**