An introduction to financial economics

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The questions in finance

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  - Agents face a stream of earnings and consumption through their lifetime which are not “matched”.
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  - Agents face a stream of earnings and consumption through their lifetime which are not “matched”.
    Some need to consume more in the present (firms), and others in the future (individuals).
  - Both earnings and consumption are uncertain.
    Both the magnitude and nature of the uncertainty changes through time.
    This is **risk**.
- Solution?
  Push consumption to the future or pull it into the present using financial instruments.

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  - What is the “fair value” of these instruments?
  - What are trade–offs when using alternative instruments?

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- Financial ecosystem: laws, assets and institutions.
- Agents are: firms and individuals.
- Similar set of problems for the government: **public finance**

  Not covered in this course.

What we focus on

- Understanding the consumption smoothing of economic agents: firms, individuals
- Types of financial assets and how they are different from each other.
- Role of assets in optimally smoothing consumption, and managing uncertainty of future consumption (risk).
- Pricing assets: equilibrium models and no-arbitrage models.
- Pricing and managing risk: financial markets
- Market microstructure: financial markets, financial assets, financial intermediaries.
- Financial market policy: law, regulation, research

Understanding firms

The firm as an economic agent

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How do firms finance their activities?

- The capital in a firm come from both debt (D) **and** equity (E).
- Both are possible sources of funding for a firm.

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- **Debt**: Creditors hope to get a fixed return from investing in the firm, irrespective of **how** successful the firm is, vs.

  Equity: Shareholders get a return that is a function of how successful the firm is.

Fundamental relationships in the corporation

- Debt is the senior claimant on the profits of the firm: If the firm produces any cash, debt gets paid first.
- Equity is the junior claimant: If there is cash leftover after debt has been serviced, it goes to equity.
- Debt has claims on the assets of the firm, when under dispute.
- Equity has control about how the firm is run.

Types of firms

Categories of firms

In the real–world, there are three main implementations of a firm:

1. *Proprietership* (e.g. most shopkeepers)
2. *Partnership* (e.g. most audit, law firms)
3. Most large-scale economic activity is organised as *limited liability* firms. Securities issuance is only done by limited liability firms.
4. In some countries, there are *limited liability partnerships* (e.g. most hedge funds).

Proprietership

- X owns the firm.
- X hires people on some contractual terms.
- X puts his own capital to work in the firm.
- *The profit, loss, debt of the firm is synonymous with the personal accounts of* X.
- If the firm goes bankrupt with debt of Rs.1 million, the personal assets of X will be liquidated by creditors seeking to get repaid.

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- The proprietership allows for multi-person teams which is better than working alone.
- Lack of overheads – legal, accounting, agency costs.
- Easy to start, easy to close down - high vitality even in India.
- Proprieterships dominate in some kinds of businesses - e.g. most shops, garages, restaurants in India.

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- Owner's wealth is locked up - is not liquid. He cannot take the money and walk away.

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- If the firm goes bankrupt with debt of Rs.1 million, the personal assets of the partners will be liquidated in proportion, by creditors seeking to get repaid.
- Hence the legal model that has generally been adopted is that *every partner has veto powers on every decision of the firm*. Complete consensus is essential.

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- Partnerships are the dominant form of organisation for lawyers, chartered accountants, hedge funds, etc.

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- Partnerships are illiquid – partners cannot easily leave the firm. Wealth is blocked.

Innovations in the structure of firms

Problems of the spice trade

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- Meat would not survive into winter without spices. Rotten meat would be inedible unless cooked in spices.
- When Constantinpole fell to the Muslims in 1453, Europe was in a desperate search for spices. Vasco da Gama found the sea route to India in 1498.
- In the 16th century, more than half the ships that set sail did not return. But those that did, gave a profit of 20$\times$
- Outfitting a ship required substantial capital.
- Standard formats - proprietership or partnership - were found to be inconvenient.

Solution – the limited liability firm

- In England and in Holland, the monarchs allowed the new concept of the “limited liability firm”.
- Investors pooled money to create the firm. The firm could take up debt. *But the liability of the investors was limited to the money they had put into the firm to create it*.
- That is - if the ship did not come back, then the creditors would not repossess the homes of the investors.

Potential problem: management cheating investors

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- The government came into the picture with regulation: Constrain the behaviour of shareholders of the limited liability firm.

Defining the limited liability firm

- The firm starts with equity capital E.
- The firm takes on debt D.
- The shareholders hire managers who form assets $V_0 = E + D$.
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- But if the firm is bankrupt then the bondholders get V_T (which is $< D$) and the shareholders get nothing.
- Even if things go bad – nobody comes after the personal assets of shareholders.

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- Limited liability firms can put together vast quantities of capital and deploy them into production, in a fashion that alternative forms of organisation simply cannot match.

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- Vast pool of shareholders lack incentives to monitor the firm and make sure that it works in their interest. Agency conflicts – managers use the firm for their personal ends.
- Most tax regimes tax the firm *and* tax investors. This means that the limited liability form of organisation of teams is penalised by double-taxation.
  For example, in India, Chidambaram removed this double taxation (1998) and Sinha brought it back (Feb 2002).

Dealing with the agency conflict

- Three-tier governance structure –
  1. Shareholders elect board of directors - to actively work with the firm, and monitor managers closely.
  2. The board hires a management team, sets salaries, etc.
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- Close supervision of the board of directors is intended to be a substitute for shareholders who lack incentives for close monitoring.
- Managers owning some shares helps align the goals of managers and the goals of owners.

Financial questions about the firm

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- Questions about agency conflicts fall under the field of "corporate finance".

Recap

Finance as the method to smooth consumption over the life time of economic agents • Manage the risk of future shocks to consumption and earnings • users of financial markets – individuals, firms, government • debt-equity in a firm • "agency-conflicts" in a firm • proprietership, partnership, limited liability firms • limited liability risk managed by governance: board of directors (shareholders) with control to fire management.

Data sources to understand debt and equity of a firm

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- Accounting standards influence the minimum quality of the data.
  With all these checks and balances in place today, there could be wilful obfuscation, but random errors will be seldom.

Example of understanding the accounts of a firm

- Suppose we setup our firm with Rs.100 of equity and Rs.100 of debt.
- Specifically, we issued 100 bonds at Rs.1 each and 1000 shares at Rs.0.1 each. (These counts are mere numeraire).
- Now our firm has *liabilities* (of two kinds) of Rs.200.
- We use this war-chest of Rs.200 to build a factory.
- The factory is our *asset*.
- Accounting identity: Total assets = total liabilities.

Example: starting point – Assets & Liabilities

Assets		Liabilities	
Factory	200	Equity	100
		Debt	100
Total	200	Total	200

The balance sheet

- This table is called “the balance sheet”, or **BS**.
- It is a statement about **stocks**.
- It uses the valuation at the time the assets/liabilities were contracted.
- It is true at a point in time.
- In principle, you could make the BS every day or every minute.
- In India, the BS is disclosed on 31 March every year at present.
- Internationally, the BS is disclosed every quarter.
- There is a move towards Indian firms disclosing their BS every quarter as well.

Example: Accounting for the firm at the end of a year

- Suppose, in the first year of operation of this factory, we spend Rs.20 on salaries and Rs.50 on raw materials. Suppose we pay out Rs.10 as interest on debt.
- Total expenditure = Rs.80.

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- Total expenditure = Rs.80.
- Suppose we manage to sell the goods for Rs.100
- This yields profit of Rs.20.
- This is the “profit & loss” or **PL** sheet.

Example: What happens to the profit?

- First, income tax has to be paid - e.g. Rs.7 out of Rs.20 goes away.
- The managers of the firm have to decide what to do with the remaining Rs.13.
- If the firm has bright prospects, they may choose to reinvest into the company.
- If the firm has bad prospects, they may choose to pay out the money to the owners' personal accounts.
- Or some mixture of payout and retention.

Example: From P&L to BS

- Suppose the managers decide to payout Rs.3 and reinvest Rs.10.
- Then a “dividend” of Rs.3 gets paid out to the shareholders.
- There are 1000 shares, which means a dividend of Rs.0.003 per share.
- Rs.10 goes back into the BS.

Example: The BS one year out

Assets		Liabilities	
Factory	200	Equity	110
Cash	10	Debt	100
Total	210	Total	210

BS vs. P&L

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- In India, the BS is disclosed at the end of every financial year (March end of every year).
  The P&L is disclosed at the end of every financial quarter (end June, end September, end December).

HW: Adopting a firm of your own

- Familiarise yourself with the CMIE Prowess database – class on 11th Jan.
- Pick a non-financial firm with market value (market capitalisation) in excess of Rs.5000 crore.
- Make a simplified BS for 2010-11 and 2011-12.
- Make a simplified P&L for 2011-12.
- Trace the flow of resources between the two financial years.

Note: Try to pick a firm that is listed on an exchange, which has some traded value every day.