An economic analysis of financial structure

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Materials

- Drawn from Chapter 8 of Mishkin.
- Another slide contains less detailed information of what I plan to cover in this topic.

Theory Financial structure

- Explains about the method/choice of financing of company; corporate finance, and household; household (personal) finances.
  - Generally speaking, "deficit units"

- Explains about the role of some key players in the financing problem of company/household

Theory Financial structure

- Not just merely understanding/surveying about the financial tools used in the financing problem.

- Attempt to explain **some stylized-facts** related to financial structure by relying on economics principles/concepts.
  - Biased choice of financing methods selected, and the relative important of some players in the market.

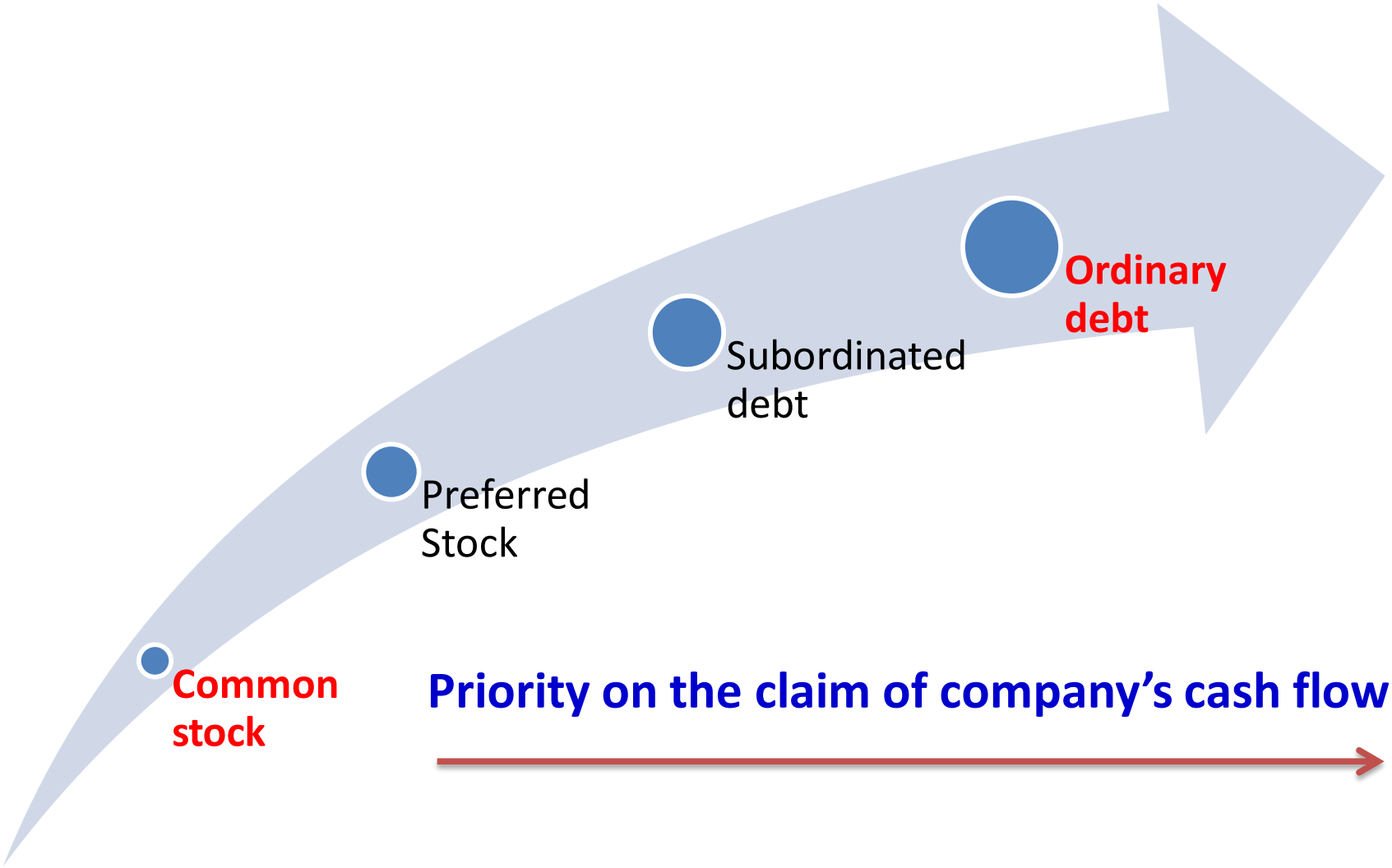
Let's understanding what it means by choices of financing

- Suppose a company has a profitable project (good return; acceptable degree of risk)
- The project needs some amount of the initial investment.
- Question: How does the company finance the investment?
- Answer:
  - Internal finance via *Cash*
  - External finance via *Direct finance* or *Indirect finance*

Direct v.s. indirect financing

- Direct financing
  - Tradable instruments: *debt instrument (bond)* and *equity instrument (stock)*
  - Various forms of debt/equity instruments

Form of financing method ranged by the structure of financial contract



Indirect finance

- Intermediary-based borrowing
- For example, via the commercial bank.
- Basically, credit loan (non-tradable debt contract)

“Internal cash” matters most!

Table 2.2 Average financing of nonfinancial enterprises, as a percentage of total financing sources, 1970–1985. *Source:* Mayer (1990).

	Canada	Finland	France	Germany	Italy	Japan	U.K.	U.S.
Retentions	54.2	42.1	44.1	55.2	38.5	33.7	72.0	66.9
Capital transfers								
Short-term securities								
Loans								
Trade credit								
Bonds								
Shares								
Other								
Statistical adjustment								

Debt as a dominant form of *external finance*, all over around the world.

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Capital transfers	0.0	0.1	1.4	6.7	5.7	0.0	2.9	0.0
Short-term securities	1.4	2.5	0.0	0.0	0.1	n.a.	2.3	1.4
Loans	12.8	27.2	41.5	21.1	38.6	40.7	21.4	23.1
Trade credit	8.6	17.2	4.7	2.2	0.0	18.3	2.8	8.4
Bonds	6.1	1.8	2.3	0.7	2.4	3.1	0.8	9.7
Shares	11.9	5.6	10.6	2.1	10.8	3.5	4.9	0.8
Other	4.1	6.9	0.0	11.9	1.6	0.7	2.2	−6.1
Statistical adjustment	0.8	−3.5	−4.7	0.0	2.3	n.a.	−9.4	−4.1

DEBT

Equity

Debt financing dominates Equity financing, by industries.

Table 2.4 Leverage in different industries. Measures of corporate net worth by industry in the United States, 1985.

Industry	Ratio of net worth to total assets	Ratio of debt to equity
All industries	0.32	2.11
Agriculture, forestry, and fishing	0.32	2.12
Mining	0.45	1.21
Construction	0.28	2.52
Manufacturing	0.45	1.20
Transportation and public utilities	0.40	1.50
Wholesale and retail trade	0.29	2.49
Services	0.31	2.25
Finance, insurance, and real estate	0.26	2.90
Commercial banks	0.08	11.00
Savings banks[1]	0.04	28.00

Source: U.S. Internal Revenue Service, White (1991).
1. Mutual savings banks plus savings and loan associations.

Credit loans from FIs is the dominant form of debt (external) financing; not tradable instrument

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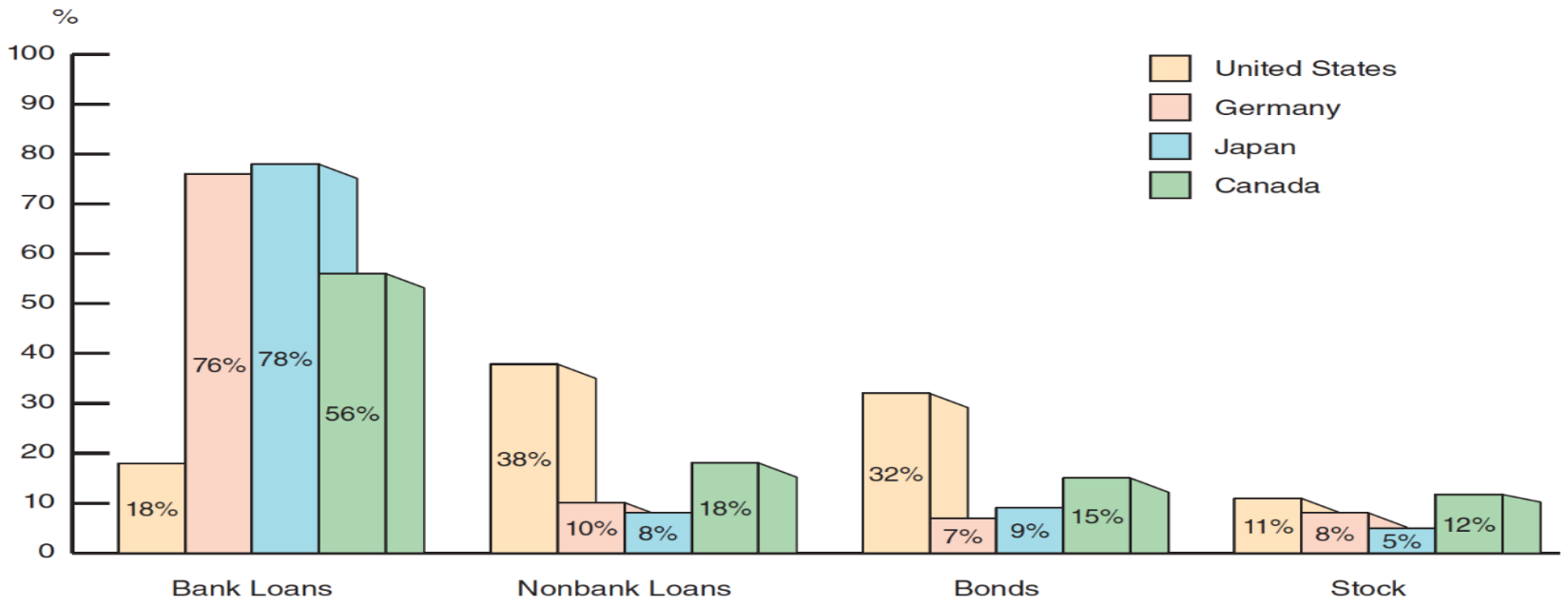
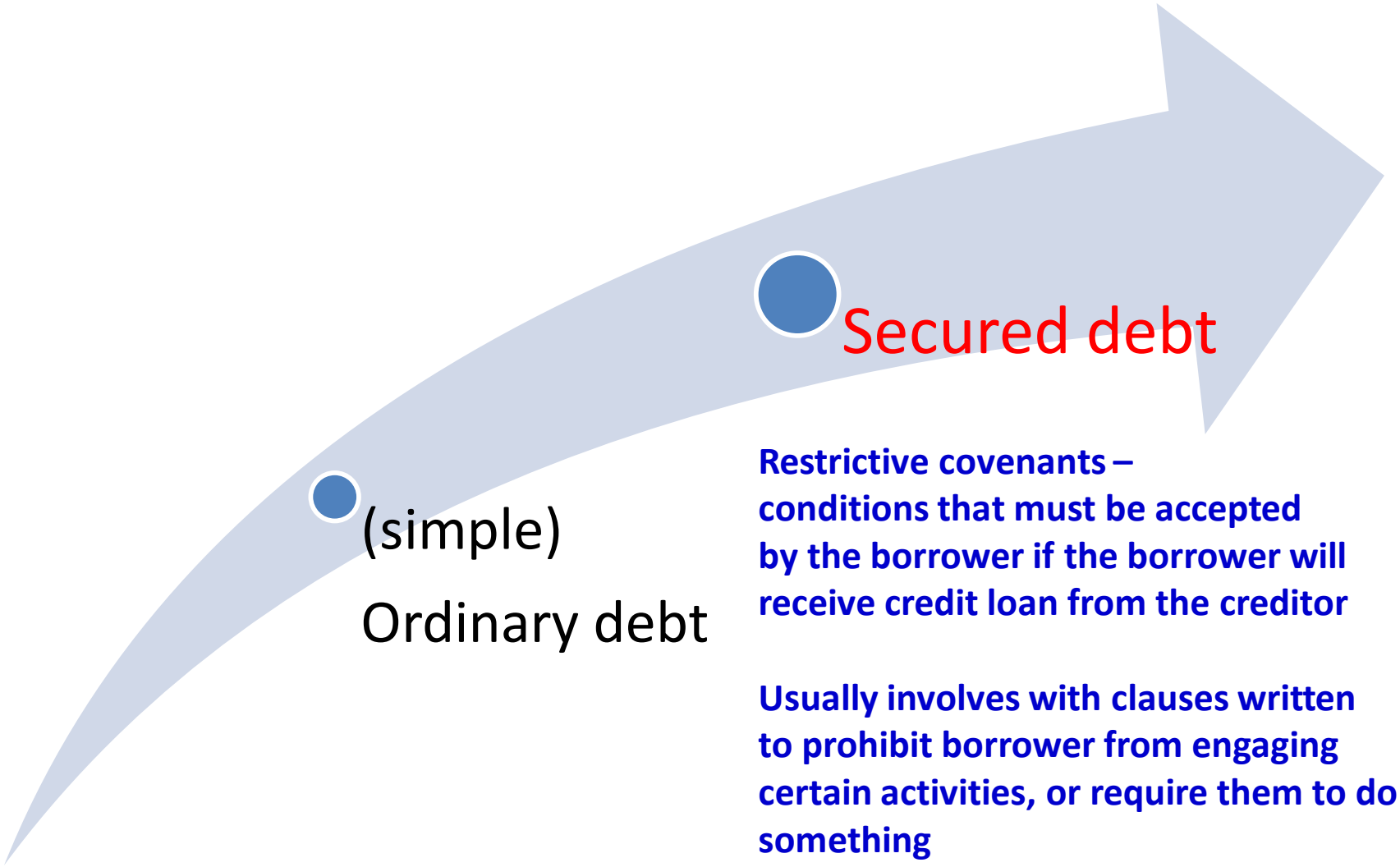
DEBT

Figure 1 (in Mishkin) Sources of External Funds for Nonfinancial Businesses: A Comparison of the United States with Germany, Japan, and Canada



Source: Andreas Hackethal and Reinhard H. Schmidt, "Financing Patterns: Measurement Concepts and Empirical Results," Johann Wolfgang Goethe-Universitat Working Paper No. 125, January 2004. The data are from 1970–2000 and are gross flows as percentage of the total, not including trade and other credit data, which are not available.

Common feature of the designed debt contract usually includes many restrictive covenants and collateral required.



Restrictive covenants – conditions that must be accepted by the borrower if the borrower will receive credit loan from the creditor

Usually involves with clauses written to prohibit borrower from engaging certain activities, or require them to do something

Basic Facts about Financial Structure Throughout the World

1. *Stocks are not the most important sources of external financing for businesses.*
2. *Issuing marketable debt and equity securities is not the primary way in which businesses finance their operations.*
3. *Indirect finance is many times more important than direct finance*
4. Financial intermediaries, particularly banks, are the most important source of external funds used to finance businesses.

Basic Facts about Financial Structure Throughout the World

5. The financial system is among the most heavily regulated sectors of the economy.
6. Only large, well-established corporations have easy access to securities markets to finance their activities.
7. *Collateral is a prevalent feature of debt contracts for both households and businesses.*
8. *Debt contracts are extremely complicated legal documents that place substantial restrictive covenants on borrowers.*

Sum up: bottom line# 1

- **Debt *or* Equity?**

  External finances heavily rely on debt financing + some special features included in the way debt contract is written/designed.

Sum up: bottom line# 2

- Direct *or* indirect

Financial intermediaries, particularly banks, are the most important source of external funds used to finance businesses.

Its role is even more important for household finances, and small enterprise.

How do we explain all the facts? (Two bottom line)

- Transaction cost theory

- Asymmetric information theory

Transaction Costs

- Financial intermediaries have evolved to reduce transaction costs.
  - Economies of scale
  - Expertise
- What cost? → cost of managing asymmetric information

Asymmetric Information: Adverse Selection and Moral Hazard

- Adverse selection occurs before a transaction occurs.
- Moral hazard arises after the transaction has developed.
- Agency theory analyses how asymmetric information problems affect economic behavior.

The Lemons Problem: How Adverse Selection Influences Market allocation

- Think about the used car as a general example.
  - Quality is only observable (without cost) by the owner.
  - If quality cannot be assessed, the buyer is willing to pay at most a price that reflects the average quality.
  - Sellers of good quality items will not want to sell at the price for average quality.
  - The buyer will decide not to buy at all because all that is left in the market is poor quality items. (Grahsam's law))
- Market for the exchange does not exist, e.g. used car and old-aged health insurance.

The Lemons Problem: How Adverse Selection Influences Financial system

- Financial system allocates capital funding to those who have profitable investment opportunity, but lack of resource.
  - Projects are risky. Project risk can only be observed by fund raiser/company.
  - Outsiders/lender who finance the project wouldn't know the true quality of the project, i.e. how risky the project is actually.
  - Without any information, lender would set pooling interest rate that reflects the average quality (risk profile) of the project in the market.
  - Low risk firm would rather stay out; only bad firm would remain.

- The size of financial system would contract; only those lender who can bear the high risk would remain. Most likely, all lenders will be driven out of the market.

Tools to Help Solve Adverse Selection Problems 1

- Private production and sale of information.
  - Adverse selection arises because of the lack of information.
  - Most brokerage firms would have their own internal research department that produces their view point on company stock's value, i.e. tradable securities.
- Unintended consequence: Free-rider problem.
  - Information will be under-produced.

Tools to Help Solve Adverse Selection Problems 2

- Government regulation to increase information
  - Requires all the listed company to meet information revelation standard.
  - Not always works to solve the adverse selection problem, explains Fact 5

Tools to Help Solve Adverse Selection Problems 3

- Financial intermediation: screening
  - What form of information production would help solving the free-rider problem?
  - Financial intermediation processes/gathers information of borrower/company through the screening method.
  - Information produced under the screening is kept for personal use; bank and financial intermediation choose to invest in non-tradable security instead.

- Explains facts 3, 4, & 6

Tools to Help Solve Adverse Selection Problems 4

- Collateral and net worth: signaling
  - Skin in the game..
  - High-risk firm would rather not want to pledge too much of its own stake in the investment.
  - The amount of collateral pledged to lender would "signal" the quality of the borrower.
- Explains fact 7

Up to this point

- How market overcome/alleviate with the problem of adverse selection
- However, adverse selection itself still cannot explain why debt contract has been extensive used in the market.
- To understand this, we need to rely on the concept of moral hazard, and see how the problem affects the choice between debt and equity contract.

Moral hazard in the general context

- Commonly known as the problem of unobserved action.

- Generally leads to the so called principle-agent problem.
  - Principal: less information
  - Agent: more information

Moral hazard: example

- The Principal-agent problem arises when the two parties do not share the same common objective, i.e. conflict of the interest.
- Consider employer/employee relationship.
  - Principal (employer) hires an employee (agent) to work for the benefit of employer.
  - Unfortunately, employer cannot observe the true effort put into the work by employee.

Moral hazard in corporate sector.

- In corporate world, the moral hazard problem is so pervasive.
- Consider the problem between stockholder and manager.
  - Stockholders hire a manager to work.
  - Manager might be tempting to exploit the, and choose any activities that do not actually benefit the stockholder.

How Moral Hazard Affects the Choice Between Debt and Equity Contracts

- A better posted question is: *"What's wrong with the equity contract under the moral hazard?"*
- Ideally, equity contract, i.e. profit-sharing contract, is optimal, but not easy to implement.

How Moral Hazard Affects the Choice Between Debt and Equity Contracts

- Profit earned is only observable without cost by company, but not to the shareholder.
- Shareholder must verify (audit) firm's earning to see if the company is reporting the true value of profit that firm actually earns. The verification process is costly.
- This leads to the costly state verification (CSV) problem.

How Moral Hazard Affects the Choice Between Debt and Equity Contracts

- What is the firm's incentive under the CSV with the use of equity contract as a tool for fundraising?
  - Firm/company tend to underreport the profit; this requires a constant monitoring/auditing action.
- Equity contract is not efficient under CSV.
- So, what is the efficient contract then?
  - Standard debt-contract with the threat of bankruptcy

How Moral Hazard Affects the Choice Between Debt and Equity Contracts

- Features of debt contract with bankruptcy threat: I OWE YOU.
  - As long as firm manages to service the debt payment (F), investor is totally okay.
  - If the company chooses not to service the debt, investor can threat to take control by exercising the bankruptcy law.
  - If bankruptcy law is used, company's asset will be liquidated. Net liquidate value of company will be returned to the debtholder.

How Moral Hazard Affects the Choice Between Debt and Equity Contracts

- *Unlike equity contract, strategic (opportunistic) default (underreporting)* will not arise under the threat of bankruptcy.
  - Firm would always choose to pay the debt if it can.
  - No firm would strategically underreport the earning, and claim that they can't pay for the debt while in fact it can. (Why?)
- Standard-debt contract with the threat of bankruptcy can induce the truth-telling action, at the lowered verification cost.
  - Lender would audit/verify the level of earning that firm can generate under the bankruptcy.

How Moral Hazard Influences Financial Structure in Debt Markets

- CSV problem can be resolved by the implementation of standard debt contract.
- However, another form of moral hazard still arise.
- Borrowers have incentives to take on projects that are riskier than the lenders would like. (Who care, it's not my money!)
  - This prevents the borrower from paying back the loan.

Tools to Help Solve Moral Hazard in Debt Contracts

- Net worth and collateral
  - Incentive compatible; self-incentivize
- Monitoring and enforcement of restrictive covenants
  - Discourage undesirable behavior
  - Encourage desirable behavior
  - Keep collateral valuable
  - Provide information
- Financial intermediation
  - Continuum of lenders needed for large project.
  - Who's going to monitor? → Free-rider problem
  - Facts 3 & 4

Summary Table 1 Asymmetric Information Problems and Tools to Solve Them

SUMMARY TABLE 1

Asymmetric Information Problems and Tools to Solve Them

Asymmetric Information Problem	Tools to Solve It	Explains Fact Number
Adverse selection	Private production and sale of information	1, 2
	Government regulation to increase information	5
	Financial intermediation	3, 4, 6
	Collateral and net worth	7
Moral hazard in equity contracts (principal–agent problem)	Production of information: monitoring	1
	Government regulation to increase information	5
	Financial intermediation	3
	Debt contracts	1
Moral hazard in debt contracts	Collateral and net worth	6, 7
	Monitoring and enforcement of restrictive covenants	8
	Financial intermediation	3, 4

Note: List of facts:
1. Stocks are not the most important source of external financing.
2. Marketable securities are not the primary source of financing.
3. Indirect finance is more important than direct finance.
4. Banks are the most important source of external funds.
5. The financial system is heavily regulated.
6. Only large, well-established firms have access to securities markets.
7. Collateral is prevalent in debt contracts.
8. Debt contracts have numerous restrictive covenants.

Application: Financial Development and Economic Growth

- *Financial repression* created by an institutional environment is characterized by:
  - Poor system of property rights (unable to use collateral efficiently)
  - Poor legal system (difficult for lenders to enforce restrictive covenants)
  - Weak accounting standards (less access to good information)
  - Government intervention through directed credit programs and state owned banks (less incentive to proper channel funds to its most productive use)

Application: Financial Development and Economic Growth

- The financial systems in developing and transition countries face several difficulties that keep them from operating efficiently.
- In many developing countries, the system of property rights (the rule of law, constraints on government expropriation, absence of corruption) functions poorly, making it hard to use these two tools effectively.