Chapter # 8

An Economic Analysis of Financial Structure

Banking in Microeconomic Theory

Consider a 2-period model \((t = 1, 2)\) with a unique physical good, initially owned by the consumers. Some of it will be consumed at date 1, the rest being invested by the firms to produce consumption at date 2. All agents behave competitively with perfect information. The subscript + represents a supply, and the subscript – a demand.
The Consumers
Maximize utility functions, \( u(C_1, C_2) \) subject to the budget constraints:

\[
C_1 + B_h + D^+ = W_i
\]
\[
C_2 = \Pi^f + \Pi_b + (1+r)B_h + (1+r_D)D^+
\]

where

\( W_i \) = initial endowment

\( \Pi^f \) & \( \Pi_b \) = profit of firms and of the bank distributed to the consumers — stockholder.

\( r \) & \( r_D \) = interest rates paid by securities and bank deposits respectively.

Since securities and bank deposits are perfect substitutes \( \Rightarrow r = r_D \).

The Firm
The firm chooses its investment level \( I \) and its financing through bank credit \( L \) and issuance of securities \( B_f \) in a way that maximizes its profit:

Maximize profit:

\[
\Pi_f = f(I) - (1+r)B_f - (1+r_L)L^-
\]

subject to the following constraint:

\[
I = B_f + L^-
\]

Again, since bank loans and securities are perfect substitutes \( \Rightarrow r = r_L \).

The Bank
The bank chooses its supply of loans \( L^+ \), its demand for deposits, \( D^- \), and the issuance of securities \( B_b \) in a way that maximizes its profits:

Maximize profits

\[
\Pi_b = r_L L^+ - r_B - r_D D^-\]

subject to the following constraint:

\[
L^+ = B_b + D^-
\]
**General Equilibrium**

Each agent behaves optimally and each market clears.

\[
\begin{align*}
I &= S \text{ (goods market)} \\
D^+ &= D^- \text{ (deposit market)} \\
L^+ &= L^- \text{ (credit market)} \\
B_h &= B_f + B_b \text{ (financial market)}
\end{align*}
\]

It is obvious that the only possible equilibrium is such that all interest rates are equal:

\[
\begin{align*}
r &= r_D = r_L \\
\Rightarrow \quad \text{banks necessarily make a zero profit at equilibrium.}
\end{align*}
\]

Also, banks’ decisions have no impact on other agents, since households are completely indifferent as to the distinctions between deposits and securities and similarly firms are completely indifferent as to bank credit versus securities (Modigliani-Miller theorem).

Two ways out of this disappointing result:

1) The incomplete information paradigm which explains why financial markets cannot be perfect and shows why banks exist.

2) The industrial organization approach to banking, which consider that banks essentially offer services to their customers (depositors and borrowers). Thus, the cost of providing these services has to be introduced, as well as some degree of product differentiation.
Basic Puzzles of Financial Structure

1) Stocks are not most important source of external financing for businesses.
2) Issuing marketable debt (bonds) and equity securities is not primary funding source for businesses.
3) Indirect finance involving financial intermediation is far more important than direct finance.
4) Banks are most important source of external finance.
5) Financial system is among most heavily regulated sectors of economy.
6) Only large, well established firms have access to securities markets.
7) Collateral is prevalent feature of debt contracts.
8) Debt contracts are typically extremely complicated legal documents with restrictive covenants.

An economic analysis of how transaction costs and information costs affect financial markets can provide us with solutions to the 8 puzzles, which in turn provide us with a much deeper understanding of how our financial system works.

**Transaction Costs**

The simplest way to justify the existence of banks is to note that their main activity is the transformation of financial contracts and securities. Specifically, they transform deposits of convenient maturity, such as demand deposits (with a low risk), into loans with a longer maturity (and with credit risk). Thus, banks (or FIs) may be viewed as providing services of divisibility, term, and risk transformation. And the provision of these services comes with a cost.
Banks simply reduce such costs that may include monetary transaction costs, search costs as well as monitoring and auditing costs.

But the Q is: why the asset transformation is not done by the borrowers themselves?

To answer this we must include the assumption of ‘economics of scale’ and / or ‘economics of scope’ that makes it profitable.

Economics of scale are obtained when the unit cost of an operation decreases as more of it is done. Economics of scope are cost savings that stem from engaging in complementary activities.

Banks take advantage of these economics of scale and scope and develop expertise to lower transaction costs. **Explains puzzle#3**

**Some Additional Points: Why Banks Exist?**

**Liquidity Insurance**

Another idea for justifying the existence of banks is to consider them as “pools of liquidity” that provide households with insurance against unforeseen and random liquidity shocks (that affect their consumption needs), supposed to be privately observed. Banks are able to perform this function and achieve “economics of scale” by acting as a large coalition of investors that is able to invest in illiquid but more profitable projects, while preserving enough liquidity to satisfy the needs of individual investors.
**Information Sharing Coalitions**

Suppose that entrepreneurs can “signal” the quality of their projects by investing more (indicating good projects) or less (indicating bad projects) of their own wealth into these projects. However, this “signaling” is costly, since “good” entrepreneurs are obliged to retain a substantial fraction of the risk of their project. It has been shown that with a coalition of borrowers (interpreted as banks), economies of scale were present, that is, the cost of credit per firm is a decreasing function of the number of firms in the coalition.

**Delegated Monitoring Theory**

It suggests that banks have a comparative advantage in monitoring the activities of borrowers as compared to individual lenders. The term ‘monitoring’ used in a broad context mean:

i) Screening projects (a priori) in a context of adverse selection.

ii) Preventing opportunistic behaviors of borrower during the realization of the project (moral hazard).

iii) Punishing a borrower who fails to meet contractual obligations.

Monitoring introduces a new problem though. The information that the monitor provide may not be reliable. Thus, the monitor has to be given incentives to do the job properly. Thus, need to invoke the personal involvement of the monitor in the project. This explains the role of banking capital.

**Explains puzzle#4**
Asymmetric Information

Assume that different economic agents possess different pieces of information on relevant economic variables, and that agents use this information for their own profit.

Adverse Selection

- Before transaction occurs.
- Potential borrowers most likely to produce adverse outcomes are ones most likely to seek loans and be selected.

Moral Hazard

- After transaction occurs.
- Hazard that borrower has incentives to engage in undesirable (immoral) activities making it more likely that won’t pay loan back.

Adverse Selection and Financial Structure

“Lemons Problem” in Securities Markets (Debt & Equity)

If cannot distinguish between ‘good’ and ‘bad’ securities, the potential borrower will be willing to pay only average of good and bad securities’ value.

Result: Good securities undervalued and firms will not issue them, bad securities overvalued so too many issued. Investors will not want to buy bad securities, so market will not function well. Explains puzzle 1&2. Also explains puzzle 6: less asymmetric information for well known firms, so smaller lemons problem.
Tools to Help Solve Adverse Selection Problem.

1) Private production and sale of information. ‘Free-rider problem’ interferes with this solution.
2) Government regulation to increase information. Explains puzzle 5
3) Financial intermediation: Avoid-free rider problem by making private loans. Explains puzzle 3&4
4) Collateral and Net Worth
   Collateral: property promised to the lender if the borrower defaults.
   Net worth: the difference between a firm’s assets and its liabilities. Explains puzzle 7

Moral Hazard: Debt vs. Equity

Moral Hazard in Equity: Principal Agent Problem

Result of separation of ownership by stockholders (principals) from control by managers (agents). Managers act in their own rather than stockholders’ interest.

Tools to Help Solve the Principal-Agent Problem

1) Monitoring: production of information.
   The problem is that the monitoring process can be expensive in term of time and money (“costly state verification”). This makes the equity contract less desirable and thus explains puzzle 1.
2) Government Regulation to increase information. Explains puzzle 5
3) Financial Intermediation
   e.g. Venture capital firm — pool the resources of their partners and the use of funds to help budding entrepreneurs start new businesses. In return, the venture capital firm receives an equity share in the new business.

   **Explains puzzle 3**

4) Debt Contracts. **Explains puzzle 1**

**Moral Hazard and Debt Markets**

**Basic problem**: borrower wants to take on too much risk.

**Tools to Help Solve Moral Hazard**

1) Net worth — it makes the debt contract “incentive-compatible”

2) Monitoring and Enforcement of Restrictive Covenants. **Explains puzzle 8**

3) Financial Intermediation
   e.g., Banks have special advantages in monitoring. **Explains puzzle 1- 4**