

Economics of Banking

Lecture 3

February 2026

Table of contents

Contents of this lecture:

1. Types of financial intermediation:
2. Shadow banking I
3. Risk management I

Different kinds of FI

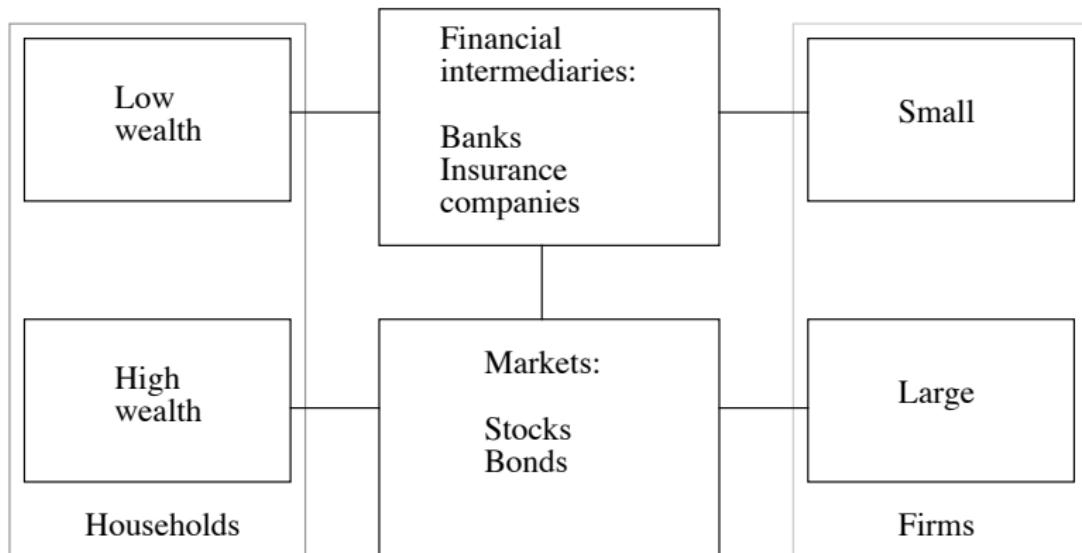
- Commercial banks
- Savings banks
- Venture capitalists
- Insurance companies
- Pension funds
- Hedge funds
- Pawn brokers
- Gambling
- Loan sharks
- Government

Types of banking business

- 1 Private banking
- 2 Commercial banking
- 3 Investment banking
- 4 Payment
- 5 Asset management
- 6 Trading
- 7 Retail brokerage
- 8 Agency

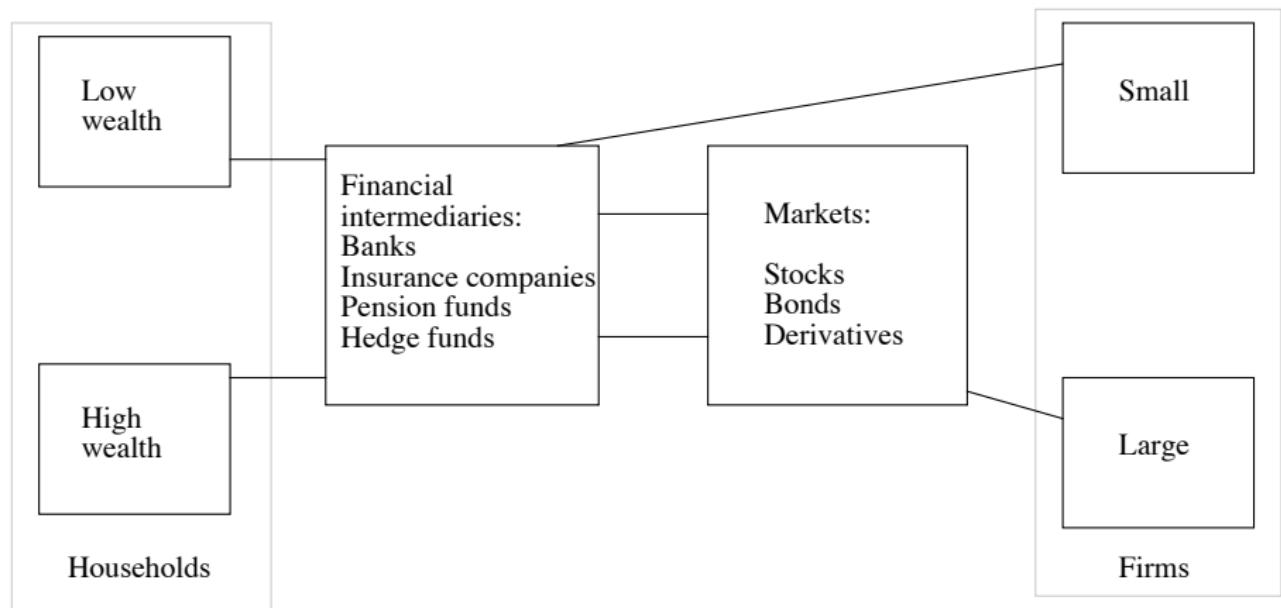
Classical banking business

The classical structure of financial intermediation:



Newer version of FI

Nowadays, the structure is more like this:



Relationship banking

Mutual knowledge of lender and borrower matters, but how?

Allen-Gale: Written contracts not always optimal, improvement possible for both.

Thakor: Knowledge of borrower allows for lender overpricing.

Freixas: Banks better than market when borrower has troubles.

A model where banks matter

Moral hazard model (two technologies, choice not observable).
 However, π_G is observable. Monitoring cost C_m .

New feature: Nonperforming loans from bank yields a benefit V (instead of 0) to the firm.

As previously, the market can be used if

$$R \leq \frac{\pi_G G - \pi_B B}{\pi_G - \pi_B},$$

and we define $\bar{\pi}_G$ as the smallest π_G for which the market works. We assume $\pi_G \geq \bar{\pi}_G$.

For each such π_G , the funding condition $\pi_G R(\pi_G) = 1$ gives that

$$R(\pi_G) = \frac{1}{\pi_G}$$

is the repayment rate in the **market**.

Banks setting rates

Some borrowers have a choice between market and bank financing:

Repayment rate set by **bank** should cover funding plus monitoring (and mark-up ρ)

$$R_m(\pi_G) = \frac{1 + m + \rho}{\pi_G},$$

with $m = (1 + \rho)C_m$.

The marginal borrower with risk $\bar{\pi}_G$ chooses the bank if

$$\bar{\pi}_G \left(G - \frac{1}{\pi_G} \right) \leq \bar{\pi}_G (G - R_m(\pi_G)) + (1 - \pi_G)V.$$

and the value π_G^* for which there is $=$ can be found:

$$\pi_G^* = 1 - \frac{\rho + m}{V},$$

Pricing in a two-period model

Model with two periods $t = 0, 1$.

Repayment rates $R_{n,t}$ for borrower with risk π_G .

Finding equilibrium rates:

$t = 1$: Repayment in renewal $R_{r,1}$ is \geq cost of new loan:

$$R_{r,1} = R_{n,1} = \frac{1 + m + \rho}{\pi_G}.$$

$t = 0$: Expected return $1 + \rho + m$ should be

$\pi_G(R_{n,0} + \pi_G R_{r,1}) = \pi_G(R_{n,0} + 1 + m + \rho)$, so that

$$R_{n,0} = \frac{(1 - \pi_G)(1 + m + \rho)}{\pi_G} (< R_{r,1}).$$

What is shadow banking?

Classical (stylized) banking consists of:

Households → Bank and Bank → Entrepreneurs

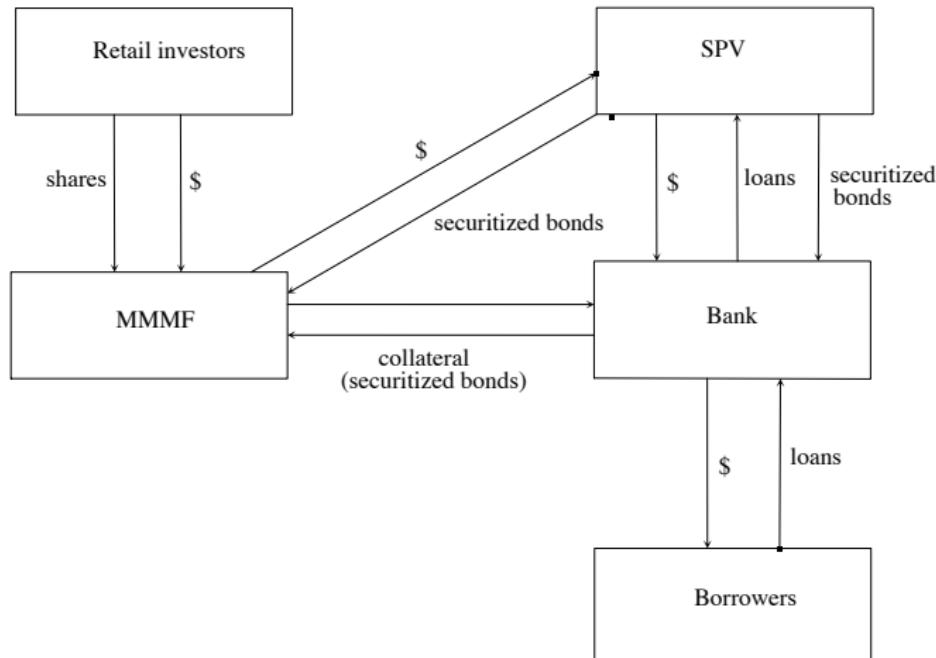
so that banking business splits into

- (i) Deposit contracts between depositors and banks
- (ii) Loan contracts between banks and entrepreneurs

However, there both of these can take alternative forms:

- (i*) Repos (repurchase agreements) instead of deposits
- (ii*) Securitization instead of loans

Shadow banking: Structure



Why shadow banking?

- (i*) In a **Repo**, the depositor owns the securities bought
If the bank defaults, the depositor keeps the securities
- (ii*) After **securitization**, the loan does not count as an asset of the bank
Matters for capital regulation of the bank – lower demand for equity

Pros and Cons of Shadow Banking

- Makes more funds available for investment
- Allows for more flexible supply of securities
- Conceals information to investors
- May increase instability of financial markets

Types of risk in a financial institution

A financial intermediary earns money by taking on risk.

Risk has several forms:

- ▶ *Liquidity risk*
- ▶ *Interest rate risk*
- ▶ *Market risk*
- ▶ *Credit risk*
- ▶ *Operational risk*

The loss function 1

General model for assessing risk:

Let V_t be observed value of a portfolio of time s

After one period the *loss* is

$$\tilde{L}_{t+1} = -(\tilde{V}_{t+1} - V_t).$$

To proceed, we need a **model** of the change in value:

There are d *risk factors*, written

$$z_t = (z_{t,1}, \dots, z_{t,d})$$

so that

$$V_t = f(t, z_t).$$

The risk factors in z_t are observable at time t but random at $t + 1$.

The loss function 2

Define the (random) *change in risk factor* $\tilde{x}_{t+1} = \tilde{z}_{t+1} - z_t$. Inserting, we get

$$\tilde{L}_{t+1} = -(f(t+1, z_t + \tilde{x}_{t+1}) - f(t, z_t)).$$

For computations, we prefer the *linearized version*

$$\ell_t = - \left(f'_t(t, z_t) + \sum_{i=1}^d f'_{z_i}(t, z_t) \tilde{x}_{t+1, i} \right).$$

An example

Portfolio of securities of types $i = 1, \dots, d$, each having value $S_{t,i}$

Value at time t is

$$V_t = \sum_{i=1}^d \lambda_i S_{t,i} = \sum_{i=1}^d \lambda_i e^{z_{t,i}}$$

where $z_{t,i} = \ln S_{t,i}$ is the **risk factor** of type i , and $x_{t,i}$ becomes rate of change in value of stock of type i .

Then

$$\begin{aligned} L_t &= -(\tilde{V}_{t+1} - V_t) = -\sum_{i=1}^d \lambda_i e^{z_{t,i}} (e^{\tilde{x}_{t,i}} - 1) \\ &\sim -\sum_{i=1}^d \lambda_i e^{z_{t,i}} \tilde{x}_{t,i} \end{aligned}$$