Banks as Secret Keepers

Tri Vi Dang Gary Gorton Bengt Holmström Guillermo Ordonez
Columbia Yale MIT UPenn

Commodity Futures Trading Commission

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Question: Why do Banks and Money Market Funds Exist?

- Produce private money and money-like securities (=liabilities). How?
- Produce information about assets and then hide it.

Asset	Liabilities
Collateral assets that back	Private Money (DD, MMF share)
Produce information about	Hide that information to keep
Loans	Liabilities stable

Private Money

- Money-like assets must have a stable (nominal) transaction value.

- In other words, "readily convertible to cash with minimal or no change in value" (Financial Accounting Standard Board).

Supply of private money

- Money market fund (MMF) shares, repo
- Agency MBS, asset-backed CP, securitized senior debt

Demand for private money

- Demand deposits at banks insured only up to $250K
- MMF is checking account for (cash-rich) corporations
- E.g. Apple parks its $145 bn cash in money instruments (~0% equity)

Efficient Markets and Money

- Asset prices reflect information and fluctuate in (informationally) efficient markets.

- Sequential trade in efficient markets cannot provide money services.

Funding Markets versus Stock Markets

Funding Markets	Stock Markets
- Cash and liability management	- Long term investment
- Delay can cause bankruptcy	- Can wait to trade shares
- No time for questions	- Much more money spent on analyses
- Shared understanding of ratings (symmetric information)	- Price discovery through continuous trading (asymmetric information)
- “Trust”-based	- Thrives on heterogeneous beliefs
- Over-the-counter trading	- Centralized exchanges

Remark

Do not regulate funding markets based on insights from stock market research.

Research Agenda on Money, Banking and Money Markets

- How to create private money (=“safe” security from risky real assets)?

  → DGH1 derive a new measure to capture “safe” (=information sensitivity)

  → DGH2 show debt is the optimal form of private money
  because debt is least information sensitive.

- How to trade private money?

  → DGH3 show repo trade is one solution
  because repo can reduce information sensitivity of debt further.

- How to design institutions for trade of private money?

  → This paper

The Story of this Paper

- There is demand for money-like securities (parking space).

- Financial securities have to be backed by real assets,
  .... but real assets are risky so financial securities are risky.

- Bank-like institutions exist to provide money backed by risky assets.

- Information is useful to invest optimally in risky assets.

- Information makes financial securities fluctuate in value.

→ Banks use information to invest,
…. but hide that same information to avoid securities to fluctuate in value.

Literature

- Two traditional views of banks
  - Asset side:
    Banks are better at producing information
    Information is beneficial in terms of reallocation
    Diamond (1984), Boyd and Prescott (1986)
  - Liability side:
    Banks provide private money.
    Information is costly in terms of liquidity.
    Diamond and Dybvig (1983), Gorton and Pennacchi (1990)
- These two sides are intimately related
    Diamond and Rajan (2001), Kashyap, Rajan and Stein (2002)

This Paper

- Internalize information that is socially valuable for investment but welfare reducing for trade
- Banks are optimally opaque so as to produce liabilities that can be used as private money

Asset	Liabilities
Collateral assets that back	Private Money (DD, MMF share)
Produce information about	Hide that information to keep
Loans	Liabilities stable

- Formalizes this idea
- Surprise: We get coexistence of banks and markets

Remark

- We do not argue that secret keeping is the only function of a bank.
- But we argue it is a very important one.
- Creation of save assets (debt) is more than diversification (selling equity)
- Indicative Evidence of opaqueness

  Securitization vehicles create debt and have no traded equity

  MMF do not announce daily NAV

  Central banks keep information about banks secret

  If a bank fails Fed secretly arranges a merger

Plan

- Model
- Capital Market versus Banks
- Information Acquisition
- Optimal Portfolio
- Empirical Evidence on opaqueness of banks
- Discussion

The Model

Setup

One storable good, three dates (t=0,1,2) and four agents.

Preferences and Endowments:

Firm:	$U_F = \sum_{t=0}^{2} c_{Ft}$	$\omega_F = (0,0,0)$
Early consumer:	$U_E = \sum_{t=0}^{2} c_{Et} + \alpha \min\{c_{E1}, k\}$	$\omega_E = (e,0,0)$
Late consumer:	$U_L = \sum_{t=0}^{2} c_{Lt}$	$\omega_L = (0, e_L, 0)$
Bank:	$U_B = \sum_{t=0}^{2} c_{Bt}$	$\omega_B = (0,0,0)$

Setup

One storable good, three dates (t=0,1,2) and four agents.

Preferences and Endowments:

Firm: $U_F = \sum_{t=0}^{2} c_{Ft}$ $\omega_F = (0,0,0)$

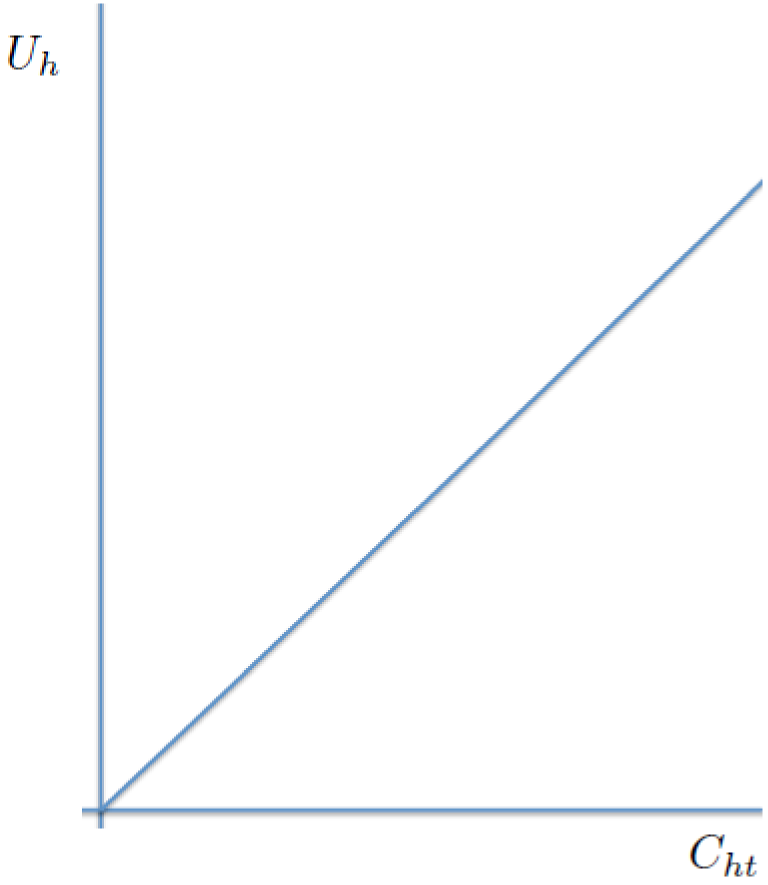
Early consumer: $U_E = \sum_{t=0}^{2} c_{Et} + \alpha \min\{c_{E1}, k\}$ $\omega_E = (w,0,0)$

Extra utility when consume at t=1: $(1+\alpha)c_{E1}$

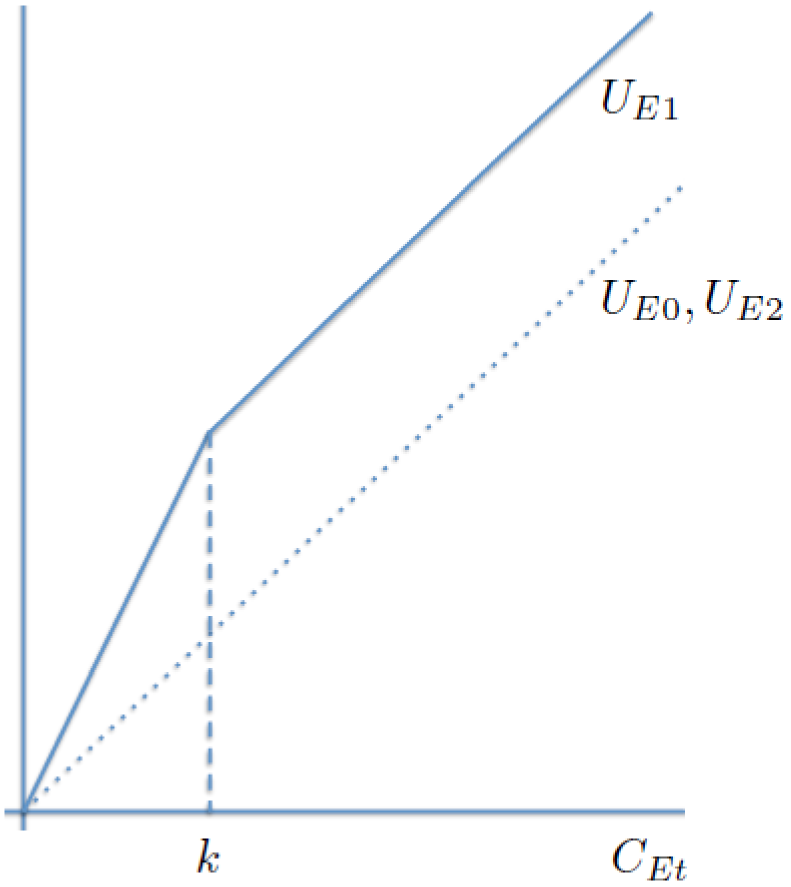
Late consumer: $U_L = \sum_{t=0}^{2} c_{Lt}$ $\omega_L = (0, w_L, 0)$ $(w_L = 2w)$

Bank: $U_B = \sum_{t=0}^{2} c_{Bt}$ $\omega_B = (0,0,0)$

Preference of h={F. L, B}



Preference of E-Agent



Production Technology and Information

The firm has a business idea

- **Project X**: Invest *w* at t=0

$$\text{At t} = 2,\ \text{it pays}\ \begin{cases} x > w & \text{with prob } \lambda \\ 0 & \text{with prob } (1-\lambda) \end{cases} \quad \text{and} \quad x\lambda > w$$

- At t=1, firm has hard evidence about failure or success and can show it to other agents (at no cost)

- **Extension**: Invest $\hat{w}$ at t=1

$$\text{At t} = 2,\ \text{it pays}\ \begin{cases} \hat{x} > \hat{w} & \text{success of X} \\ 0 & \text{failure of X} \end{cases} \quad \text{and} \quad \lambda\hat{x} < \hat{w}$$

Assumptions

- Early consumer can cover his liquidity needs and the investment needs, but not both

  $e > k$ and $e > w$ but $e < w + k$

  → $z \equiv e - w < k$ (useful notation)

- Both consumers can cover all liquidity and investment needs

  $e + e_L > k + w + \hat{w}$

Benchmarks

Autarky

Consumers store without interacting with firms.

First Best

At t=0:

Use w from E to finance project X.

At t=1:

Transfer $k-z$ from L to E. $(k-z=k-(e-w))$

Use $\hat{w}$ from L to finance a worthy extension

Expected Utility Comparison

Autarky		First Best	
$U_F = 0$	$<$	$U_F = \underbrace{\lambda x - w}_{>0} + \lambda(\underbrace{\hat{x} - \hat{w}}_{>0}) = \lambda\mu - w$	$(\mu \equiv x + \hat{x} - \hat{w})$
$U_E = e + \alpha k$		$U_E = e + \alpha k$	
$U_L = e_L$		$U_L = e_L$	
$U_B = 0$		$U_B = 0$	

Capital Market

Time in Capital Markets

Date t=0	The firm finances the project costing w by issuing a security that pays $s(b)$ in case of failure and $s(g)$ in case of success.
Date t=1	The firm learns whether the project will pay x (success) or 0 (failure) in $t=2$. If the project succeeds the firm finances an extension costing $\hat{w}$ by issuing a new security, $\hat{s}(g)$. The early consumer trades a fraction of his security with the late consumer to consume k.
Date t=2	Project payoffs realized and securities are paid.

Financing the Extension and Trading

Date 1

If project fails

- F cannot show extension is profitable and does not issue new security
- No issuance reveals the project has failed
- L does not buy first security for more than s(b)

If project succeeds

- F shows extension is profitable and issues new security $\hat{s}(g) = \hat{w}$ to L
- This reveals the project has succeeded
- L does not buy first security for more than s(g)

Financing the Project

Date 0

- F issues a risky security that pays s(b) or s(g) at t=2 to borrow from E
- We assume F has limited liability: $s(b) = 0$ and $s(g) \leq x + \hat{x} - \hat{w} \equiv \mu$
- We assume F has negotiation power:

  Since L can buy s(g) from E at t=1, breakeven condition for E:

$$EU_E(finance) = (1+\alpha)z + \lambda[s(g) + \alpha(k-z)] \overset{!}{=} e + \alpha k = U_E(storage)$$

$$\rightarrow \qquad s(g) = \frac{w}{\lambda} + \frac{\alpha(1-\lambda)}{\lambda}(k-z)$$

Remark

F issues s(x) with $\begin{cases} s(b) = 0 \\ s(g) = \dfrac{w}{\lambda} + \dfrac{(1-\lambda)\alpha(k-z)}{\lambda} \end{cases}$

Note,

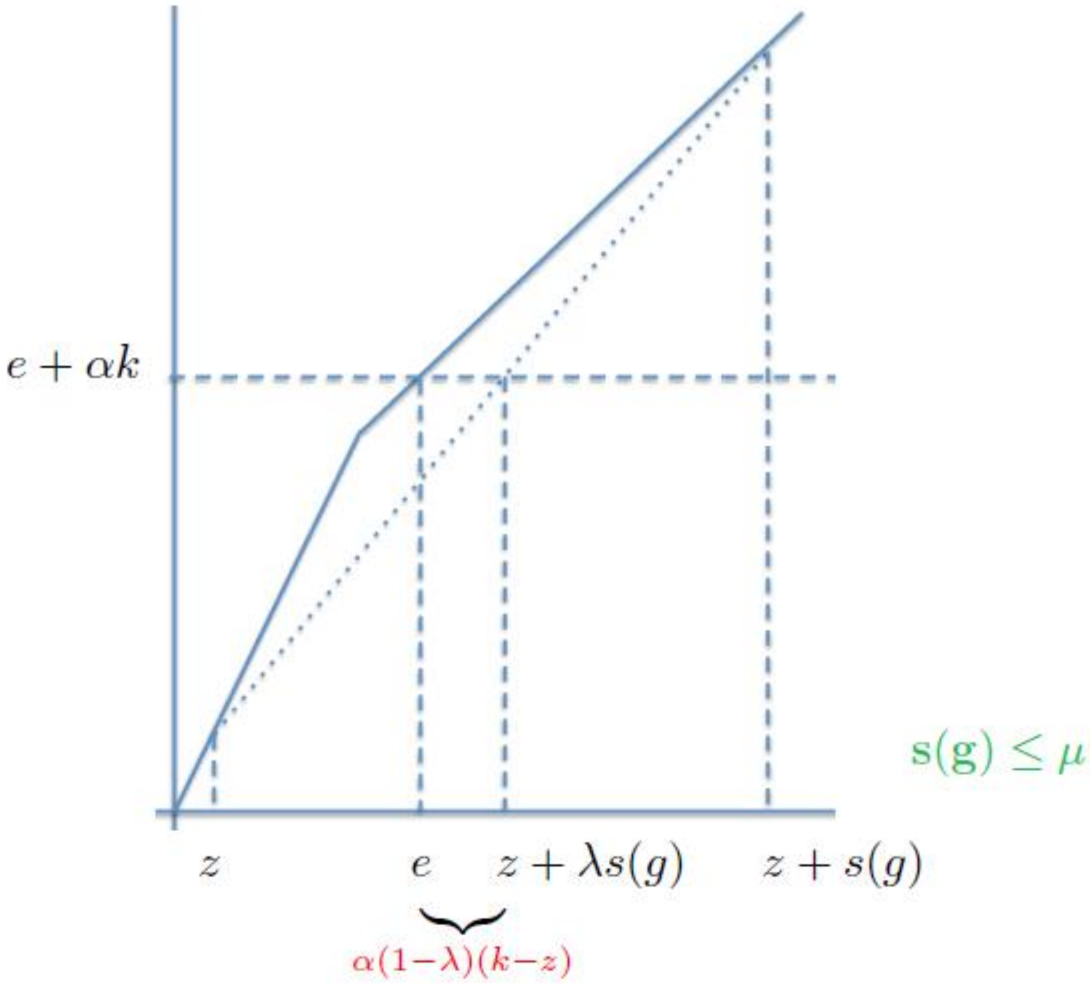
$$E[s(x)] = (1-\lambda)s(b) + \lambda \cdot s(g)$$

$$E[s(x)] = \underset{\substack{\uparrow \\ \text{Certainty equivalent}}}{w} \quad + \quad \underset{\substack{\uparrow \\ \text{Risk premium}}}{(1-\lambda)\alpha(k-z)}$$

(utility loss of not consuming desired amount at t=1)

- λ measures project "risk"
- α measures "concavity" of E utility function

Risky Consumption for E



Welfare Loss Type I in Capital Market (due to Risk Premium)

If $s(g) = \frac{w}{\lambda} + \frac{(1-\lambda)\alpha(k-z)}{\lambda} \leq \mu$ → F can finance project.

First Best	Market outcome
$EU_F = \lambda\mu - w$	$EU_F = \lambda\mu - \lambda s(g)$
$EU_E = e + \alpha k$	$EU_E = e + \alpha k$
$EU_L = e_L$	$EU_L = e_L$
$EU_B = 0$	$EU_B = 0$

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$EU_B = 0$	$EU_B = 0$

Welfare Loss Type I in Capital Market (due Risk Premium)

If $s(g)=\frac{w}{\lambda}+\frac{(1-\lambda)\alpha(k-z)}{\lambda}\leq\mu$ → F can finance project.

First Best		Market outcome
$EU_F=\lambda\mu-w$	>	$EU_F=\lambda\mu-w-\boxed{(1-\lambda)\alpha(k-z)}$
$EU_E=e+\alpha k$		$EU_E=e+\alpha k$
$EU_L=e_L$		$EU_L=e_L$
$EU_B=0$		$EU_B=0$

Welfare Loss: $(1-\lambda)\alpha)(k-z)$ (F pays a risk premium)

Remark

If risk premium is too high, then F cannot borrow and invest.

Welfare Loss Type II in Capital Market (No Investment)

If $s(g) = \frac{w}{\lambda} + \frac{(1-\lambda)\alpha(k-z)}{\lambda} > \mu$ → no project X

First Best		Market outcome
$EU_F = \lambda\mu - w$	$>$	$EU_F = 0$
$EU_E = e + \alpha k$		$EU_E = e + \alpha k$
$EU_L = e_L$		$EU_L = e_L$
$EU_B = 0$		$EU_B = 0$

Welfare Loss: $\lambda\mu - w$

Proposition

- Sequential trade in markets does not implement First Best allocations.

Reason

- When L knows the value of s(x) at t=1 he does not pay w for s(b)=0.

  → Commitment problem of L

- Socially valuable information for investment at t=1 has negative externality on trade between E and L at t=1.

Complete Contracting at t=0

- At t=0: L signs binding contract to buy s(x) for price w at t=1.
  - → E faces no resale risk.
  - → No negative feedback on finance at t=0.

- First Best is implemented

  - F sells E[s(x)]=w to E at t=0 (no risk premium needed)

Remark

If L is not present at t=0, then this is not feasible.

We show later that banks dominates complete contracting under realistic assumptions

Financial Intermediation

Objective

We show that a bank can implement First Best without ex ante complete contracting among all agents.

Timing with Banks

Date t=0

The early consumer deposits *e* with the bank. The bank promises an unconditional payment r_1^E at $t=1$ and a conditional payment $r_2^E(g)$ if the project succeeds and $r_2^E(b)$ if the project fails at $t=2$

The bank lends *w* to the firm with a loan contract, where the firm pays *s(b)* if the project fails and *s(g)* if is succeeds.

Date t=1

The firm learns whether the project will pay *x* (success) or *0* (failure) in $t=2$.

The late consumer deposits e_L and the bank promises a conditional payment $r_2^L(g)$ if the project succeeds and $r_2^L(b)$ if the project fails at $t=2$.

If the project succeeds the banks lends $\hat{w}$ to the firm with a new loan contract, $\hat{s}(g)$. The bank keeps this secret.

The early consumer withdraws r_1^E and consumes.

Date t=2

Project payoffs realized and loans are repaid.

Financing the Extension

Date 1

If project fails

- F cannot show extension is profitable and does not ask for a new loan
- B infers that the project has failed

If project succeeds

- F shows extension is profitable and issues new loan for $\hat{s}(g) = \hat{w}$
- B infers that the project is a success

Assume B can keep secret and consumer cannot acquire information about project.

Question: What contract should B offer to E and L such that they are willing to deposit their (total) endowment and E can withdraw k at t=1?

Bank Contracts

	Assets of B (t=1)
Project fails (**b**ad) $(1-\lambda)$	$e_L + z$
Project succeeds (**g**ood) λ	$e_L + z + s(g)$

Note: $z \equiv e - w$

Bank Contracts

	Assets of B (t=1)	Promises to E	Promises to L
Project fails (**b**ad) $(1-\lambda)$	$e_L + z$	$k + r_1^E(b)$	$r_2^L(b)$
Project succeeds (**g**ood) λ	$e_L + z + s(g)$	$k + r_1^E(g)$	$r_2^L(g)$

Note: $z \equiv e - w$

Bank Contracts

	Assets of B (t=1)	Promises to E	Promises to L
Project fails (**b**ad) $(1-\lambda)$	$e_L + z$	$k+0$	$r_2^L(b)$
Project succeeds (**g**ood) λ	$e_L + z + s(g)$	$k + r_1^E(g)$	$r_2^L(g)$

Note: $z \equiv e - w$

Bank Contracts

	Assets of B (t=1)		Promises to E	Promises to L
Project fails (**b**ad) $(1-\lambda)$	$e_L + z$	$=$	k	$e_L + z - k$
Project succeeds (**g**ood) λ	$e_L + z + s(g)$		$k + r_1^E(g)$	$r_2^L(g)$

Note: $z \equiv e - w$

Bank Contracts

	Assets of B (t=1)	Promises to E	Promises to L
Project fails (**b**ad) $(1-\lambda)$	$e_L + z$	k	e_L+z-k
Project succeeds (**g**ood) λ	$e_L + z + s(g)$	$k+(e+k)/\lambda$	$r_2^L(g)$

⇧

E breaks even if $(1+\alpha)k + \lambda r_1^E(g) = e + \alpha k$

Note: $z \equiv e - w$

Bank Contracts

	Assets of B (t=1)	Promises to E	Promises to L
Project fails (**b**ad) $(1-\lambda)$	e_L+z	k	e_L+z-k
Project succeeds (**g**ood) λ	$e_L+z+s(g)$	$k+(e+k)/\lambda$	$e_L+(1-\lambda)(k-z)/\lambda$

⇧

L breaks even if $(1-\lambda)(e_L+z-k)+\lambda r_2^L(g)=e_L$

Note: $z\equiv e-w$

Bank Contracts

	Assets of B (t=1)	Promises to E	Promises to L
Project fails (**b**ad) $(1-\lambda)$	$e_L + z$	k	e_L+z-k
Project succeeds (**g**ood) λ	$e_L + z + s(g)$	$k+(e+k)/\lambda$	$e_L+(1-\lambda)(k-z)/\lambda$

Are these promises in the good state feasible?

$$k + r_2^E(g) + r_2^L(g) = e_L + z + s(g)$$

Bank Contracts

	Assets of B (t=1)	Promises to E	Promises to L
Project fails (**b**ad) $(1-\lambda)$	$e_L + z$	k	e_L+z-k
Project succeeds (**g**ood) λ	$e_L + z + s(g)$	$k+(e+k)/\lambda$	$e_L+(1-\lambda)(k-z)/\lambda$

Are these promises in the good state feasible? Yes

$$k + r_2^E(g) + r_2^L(g) = e_L + z + s(g) \Longrightarrow s(g)=w/\lambda \quad \text{since } x\lambda > w$$

Proposition

Bank implements First Best (Project is always financed).

First Best		Bank
$EU_F = \lambda\mu - w$	$=$	$EU_F = \lambda\mu - \underbrace{\lambda s(g)}_{w}$
$EU_E = e + \alpha k$	$=$	$EU_E = e + \alpha k$
$EU_L = e_L$	$=$	$EU_L = e_L$
$EU_B = 0$	$=$	$EU_B = 0$

Information Acquisition

L’s Incentive to find out Secret

- So far we have assumed a secret cannot be discovered by consumers
- L may have an incentive to acquire information privately
- Assume the cost of information is γ in units of consumption

Value of Information

- If L does not acquire information before depositing

$$\lambda r_2^L(g) + (1-\lambda) r_2^L(b)$$

- If L acquires information before depositing

$$\lambda r_2^L(g) + (1-\lambda) e_L - \gamma$$

(no deposit in bad state, keep e_L)

Value of Information

- If L does not acquire information before depositing

$$\lambda r_2^L(g) + (1-\lambda) r_2^L(b)$$

- If L acquires information before depositing

$$\lambda r_2^L(g) + (1-\lambda) e_L - \gamma$$

(no deposit in bad state, keep e_L)

- L does not acquire information if

$$(1-\lambda)(e_L - r_2^L(b)) \leq \gamma$$

Avoiding Information Acquisition

- L does not acquire information if

$$(1-\lambda)(e_L - r_2^L(b)) \leq \gamma$$

→ $$r_2^L(b) \geq e_L - \frac{\gamma}{1-\lambda}$$

Note, if information cost low, E can withdraw little at t=1.

Distortionary Bank Contracts

- How can bank prevent information acquisition and still improve welfare?
- Bank can increase $r_2^L(b)$ to reduce the benefit of information to L.
- Two options
  - Distorting money provision (E can withdraw less at t=1)
  - Distorting investments (smaller loan to F)

BANKS DISTORT MONEY PROVISION

	Assets of B $(t=1)$	Promises to E	Promises to L
Project fails (b) $(1-\lambda)$	$e_L + z$	$r_1^E + r_2^E(b)$	$r_2^L(b)$
Project succeeds (g) λ	$e_L + z + s(g)$	$r_1^E + r_2^E(g)$	$r_2^L(g)$

BANKS DISTORT MONEY PROVISION

	Assets of B ($t=1$)	Promises to E	Promises to L
Project fails (b) $(1-\lambda)$	$e_L + z$	$r_1^E + r_2^E(b)$	$\underbrace{e_L - \frac{\gamma}{1-\lambda}}_{>e_L+z-k}$
Project succeeds (g) λ	$e_L + z + s(g)$	$r_1^E + r_2^E(g)$	$r_2^L(g)$

Banks Distort Money Provision

	Assets of B $(t=1)$	Promises to E	Promises to L
Project fails (b) $(1-\lambda)$	$e_L + z$	$r_1^E + 0$	$\Leftarrow \underbrace{e_L - \frac{\gamma}{1-\lambda}}_{> e_L + z - k}$
Project succeeds (g) λ	$e_L + z + s(g)$	$r_1^E + r_2^E(g)$	$r_2^L(g)$

Banks Distort Money Provision

	Assets of B $(t=1)$	Promises to E	Promises to L
Project fails (b) $(1-\lambda)$	$e_L + z$	$\underbrace{z + \frac{\gamma}{1-\lambda}}_{<k} \Leftarrow$	$\underbrace{e_L - \frac{\gamma}{1-\lambda}}_{>e_L+z-k}$
Project succeeds (g) λ	$e_L + z + s(g)$	$r_1^E + r_2^E(g)$	$r_2^L(g)$

Banks Distort Money Provision

	Assets of B ($t = 1$)	Promises to E	Promises to L
Project fails (b) $(1 - \lambda)$	$e_L + z$	$z + \frac{\gamma}{1-\lambda}$	$\underbrace{e_L - \frac{\gamma}{1 - \lambda}}_{>e_L+z-k}$
Project succeeds (g) λ	$e_L + z + s(g)$	$z + \frac{\gamma}{1-\lambda} + \frac{e-k}{\lambda}$ $+\frac{(1+\alpha)}{\lambda}\left[k - z - \frac{\gamma}{1-\lambda}\right]$	$e_L + \frac{\gamma}{\lambda}$

Are these promises feasible?

$$r_1^E + r_2^E(g) + r_2^L(g) \leq e_L + z + s(g) \quad \Rightarrow \quad s(g) = \frac{w}{\lambda} + \frac{\alpha}{\lambda}\left[k - z - \frac{\gamma}{1-\lambda}\right]$$

Proposition

Distortion of money provision of banks dominates capital markets if

$$\underset{\substack{\uparrow \\ \text{Welfare loss} \\ \text{of bank}}}{\alpha\left[k - z - \frac{\gamma}{1-\lambda}\right]} \leq \underset{\substack{\uparrow \\ \text{Welfare loss} \\ \text{of markets}}}{\alpha(1-\lambda)(k-z)}$$

Banks Distort Investment

		Assets of B $(t = 1)$	Promises to E	Promises to L
Project fails (b) $(1 - \lambda)$	η	$e_L + z$		
	$+(1 - \eta)$	$e_L + z + w$		

Banks Distort Investment

		Assets of B $(t = 1)$	Promises to E		Promises to L
Project fails (b)	η	$e_L + z$	**k**	$\Rightarrow$	$e_L + z - k$
$(1 - \lambda)$	$+(1 - \eta)$	$e_L + z + w$			$+(1 - \eta)w$

Banks Distort Investment

		Assets of B ($t=1$)	Promises to E		Promises to L
Project fails (b) $(1-\lambda)$	η	$e_L + z$	$\mathbf{k}$	$\Rightarrow$	$e_L + z - k$
	$+(1-\eta)$	$e_L + z + w$			$+(1-\eta)w$

Optimal contract is implementable such that $s(g) = \frac{w}{\lambda}$

Information can be avoided when

$$1 - \eta = \frac{1}{w}\left[k - z - \frac{\gamma}{(1-\lambda)}\right] \geq 0$$

Cost of distortion: $= (1-\eta)E(U_F^{FB}) = \frac{\lambda\mu - w}{w}\left[k - z - \frac{\gamma}{1-\lambda}\right]$

Which Distortion is Better?

Distortion of money provision of banks dominates capital markets if

$$\alpha\left[k - z - \frac{\gamma}{1-\lambda}\right] \leq \alpha(1-\lambda)(k-z)$$

Distortion of investments by banks dominates capital markets if

$$\frac{\lambda\mu - w}{w}\left[k - z - \frac{\gamma}{1-\lambda}\right] \leq \alpha(1-\lambda)(k-z)$$

Distortion of money provision dominates distortion of investments

$$(1+\alpha)w \leq \lambda\mu$$

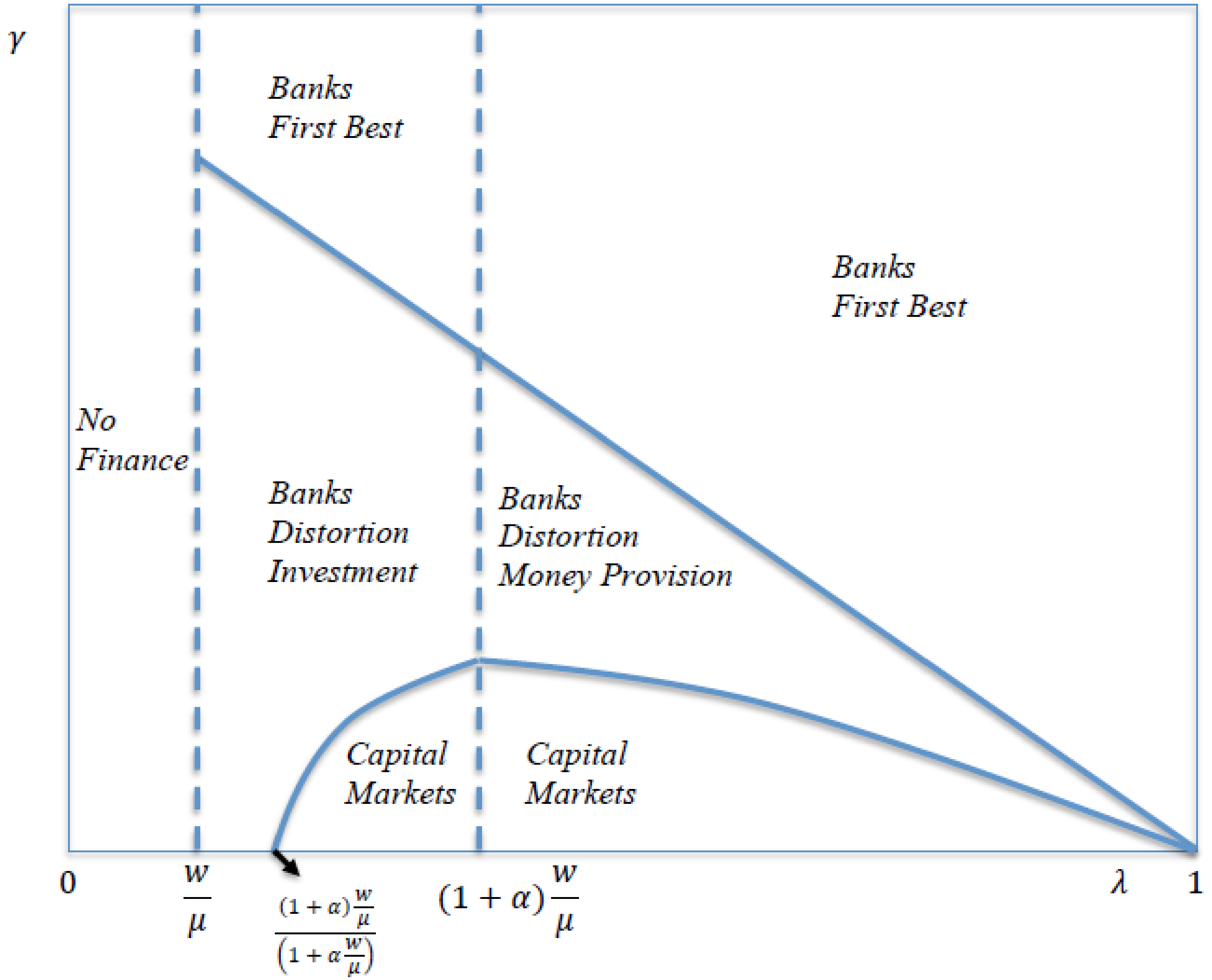
Regions

- Assume a continuum of agents with mass 1 each.
- Projects differ on two dimensions (λ_i, γ_i).
- Replicate the economy of bilateral trade above.

Proposition

Some projects are financed through banks and other by markets.

Regions


γ
Banks
First Best
Banks
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No
Finance
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Distortion
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Money Provision
Capital
Markets
Capital
Markets
0
$\frac{w}{\mu}$
$\frac{(1+\alpha)\frac{w}{\mu}}{\left(1+\alpha\frac{w}{\mu}\right)}$
$(1+\alpha)\frac{w}{\mu}$
λ
1

Extensions of Basic Model

Portfolio Choice

L has less incentive to acquire information and more incentive to deposit

- Adding save assets (Treasuries)
- Diversification
- Bank capital

Bank Capital Discourages Information Acquisition

- B is endowed with e_B at t=2.

- Condition for no information acquisition

$$\underset{\substack{\uparrow \\ \\ e_L + z - k + e_B}}{r_2^L(b)} \geq e_L - \frac{\gamma}{1-\lambda}$$

- We show this is feasible.

Banks versus Ex Ante Contracting

Assumption (Limit version of institutional reality)

- There is a continuum of small L agents.
- Each has a stochastic endowment e_L or 0 with $\int e_L dh = k$ at t=1.
- There is no uncertainty about aggregate endowment.

Complete Contracting at t=0

- F and E need to contract will all L agents (infinitely many contracts).
- E needs to verify the endowment of all L agents.

Banking

- If designed in an incentive compatible way,
- All L agents with positive endowment deposit with bank at t=1.
- E can withdraw w from bank at t=1.

Empirical Evidence

Observation about MMF

- Announcement of NAV with a three month lag.

- Reuters (02/07/12), “Fidelity fights SEC money-market fund proposals”:

> *Nearly 60 percent of institutional investors surveyed by Fidelity said they would move all or some of their assets out of money funds if the net asset value were allowed to fluctuate.*

Empirical Studies of Banks

- The equity returns of banks deliver less firm-specific information than those of matching industrial firms.

  Hirtle (2006) and Haggard and Howe (2007)

- Bond rating agencies are more likely to disagree on the ratings of banks compared to other firms.

  Morgan (2002) and Ianotta (2006)

- Banks are opaque in their loans, not on their trading assets.

  Flannery, Kwan and Nimalendran (2004)

Discussion

Implications

- Banks and MMF are optimally opaque.
- This may require monitoring by regulator.
- But regulator should be careful about disclosing information.
- Opacity is critical for private money and cheaper loans to borrowers.