

The Dark Side of Bank Wholesale Funding

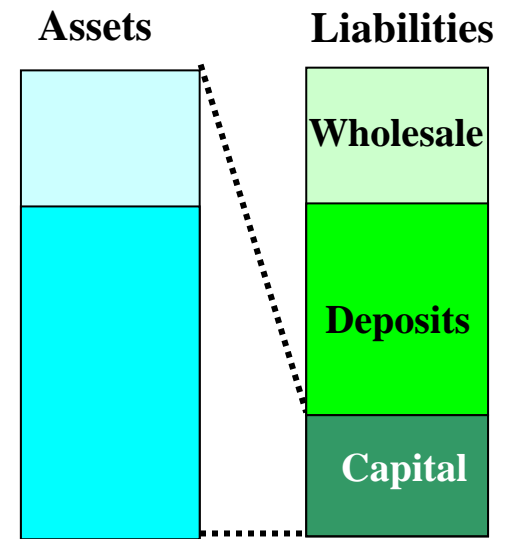
Rocco Huang
Philadelphia Fed

Lev Ratnovski
Bank of England

May 08

Introduction

Bank Funding



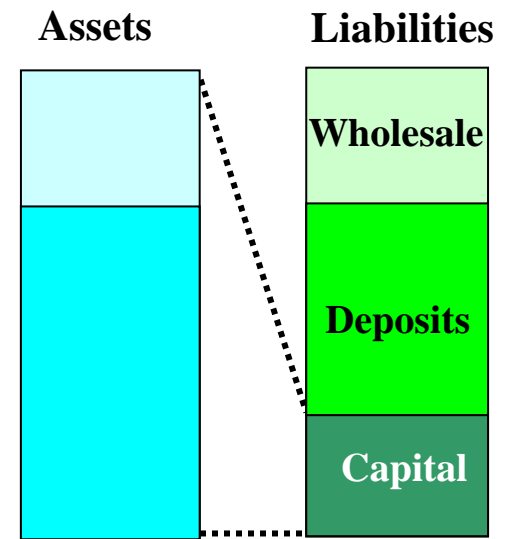
- **Retail deposits**

- Insured, passive → Effectively long-term
- Limited supply → Unused investment opportunities

- **Short-term wholesale funds**

- Rolled over frequently
- Other fin institutions, non-fin corps, state/local authorities, foreign entities, money market mutual funds...
- Repo's, Interbank deposits, Fed Funds, large denomination CDs, commercial papers...

Short-Term Wholesale Funds



- “Bright side”
 - Fully exploit investment opportunities
 - Market discipline (Calomiris, 1999)
 - Reduced liquidity risks (Goodfriend & King, 1998)

- “Dark side”
 - Aggressive lending + compromised credit quality
 - Limited market discipline
 - Sudden stops + inefficient liquidations

- Reconcile?

Wholesale funds in past bank failures

- **Act on publicly-available information**
- **Run and escape unscathed**

- Continental Illinois
- Northern Rock
- Bear Stearns

Wholesale funds in past bank failures

1. Continental Illinois

- Exposure to energy sector and Penn Square
- Wholesale depositors withdrew
- The Fed kept lending to prop up the bank
- Wholesale depositors did not experience loss or delay
- Retail depositors (and ultimately FDIC) held the bag

2. Northern Rock

3. Bear Stearns

Wholesale funds in past bank failures

1. Continental Illinois

2. Northern Rock

- U.S. subprime mortgage crisis
- Wholesale financiers refuse to renew funding
- After a while, NR had to turn to BoE for assistance
 - Did not stop exit by wholesale funds
- ***Then*** retail deposit run finally started
- *Short-term* wholesale investors did not lose a penny

3. Bear Stearns

Wholesale funds in past bank failures

1. Continental Illinois

2. Northern Rock

3. Bear Stearns

- Worries about CDO market and Bear Stearns' solvency
- *Secured* lenders (~\$32 billion) refused to continue funding
- Liquidity pool (~18 billion) sold off to fund their exits
- Long-term securities (~\$80 billion) and customer funds (net ~ \$60 billion) bailed out by JP Morgan and the Fed
- Note: customer funds are insured by SIPC up to \$500,000

Wholesale funds in past bank failures

1. Continental Illinois
2. Northern Rock
3. Bear Stearns

- **Act on publicly-available information**
 - Cheap but *noisy*
 - Both “correct” and “incorrect” liquidations
- **Run and escape unscathed**
 - Effective seniority due to first-come first-served
 - Central bank support also helps finance exit

This paper

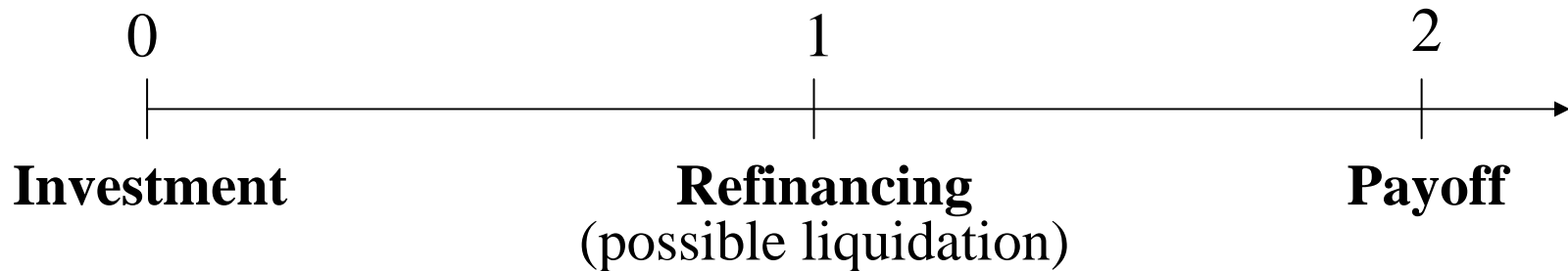
- “Bright side” vs. “Dark side” of wholesale funding
 Informed vs. Uninformed
 - Incentives to become informed
 - Incentives to liquidate when uninformed
 - Contracting: optimal seniority of short-term wholesale funds
- Incentives of banks to use short-term wholesale funds

Approach

- **Benchmark: Calomiris and Kahn (1991)**
 - Sophisticated funding beneficial: can monitor & liquidate bad
 - Seniority maximizes monitoring (allows to internalize benefits)
- **“Bright side”**
- **Add: A costless noisy (public) signal on bank quality**
 - Lower incentives to monitor
 - Excess incentives to liquidate: based on too noisy information
 - Particularly when senior
- **“Dark side”**

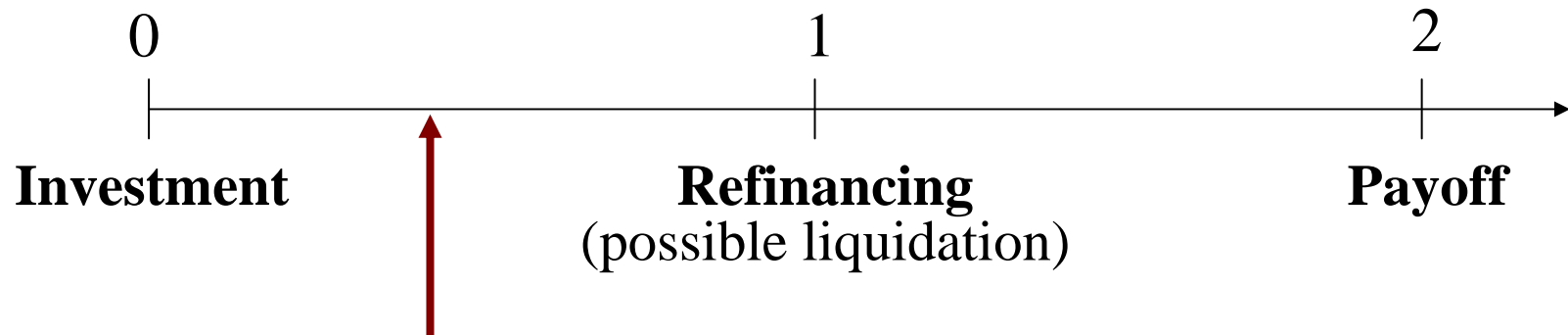
The Model

Setup



- A bank with a long-term investment project
 - t=0: investment size 1
 - t=1: liq value L small: $L < 1$ and $L < pW$
 - t=2: X w.p. p or 0 w.p. $1 - p$ $pX > 1$
- Funding
 - Deposits: $D < 1$ (long-term: stay until t=2)
 - Wholesale funds: $W = 1 - D$ (short-term: roll over at t=1)
 - Seniority in liquidation $s \in [0; 1]$: wholesale receive sL

Setup



Information of wholesale financiers

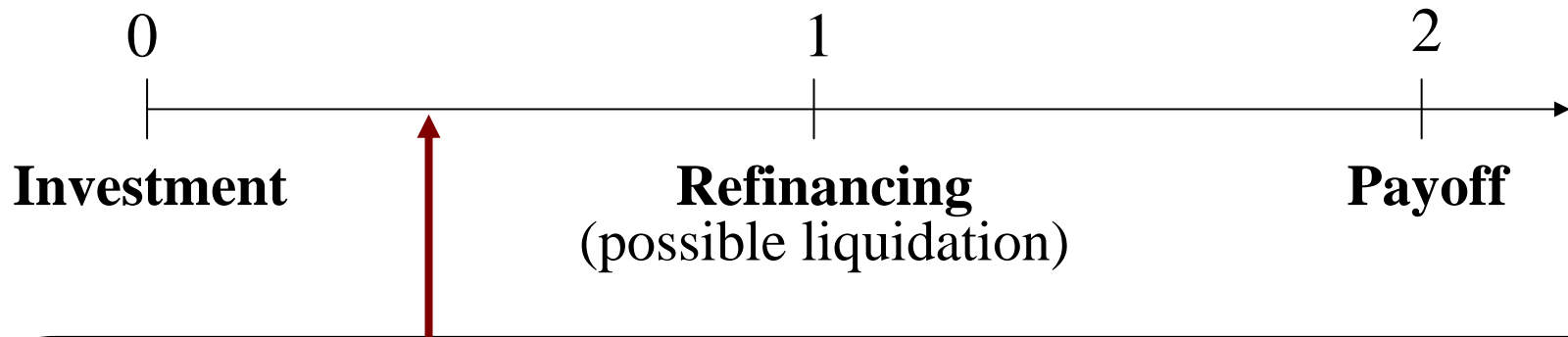
1. Monitoring

- Invest $C(m)$, correct signal w.p. m , no signal otherwise
- “good”: roll over, “bad”: liquidate, no signal: roll over

➤ Calomiris-Kahn (1991) benchmark

1. Objective: maximize m
2. Solution: set $s = 1$

Setup



Information of wholesale financiers

1. Monitoring

- Invest $C(m)$, correct signal w.p. m , no signal otherwise
- “good”: roll over, “bad”: liquidate, no signal: roll over

2. Costless noisy signal

- When monitoring produced no signal
- Provides *some* information

Costless Noisy Signal

- Precision $\theta \in [0;1]$
- Publicly available information
 - e.g., Sector-wide or Market-wide news
- Relevance: can depend on asset types
 - Mortgages: relevant information from MBS prices
 - Small business loans: no similarly informative signal
- Correct or Incorrect
 - Energy prices and Continental Illinois
 - US subprime mortgages and Northern Rock

Liquidations based on a Noisy Signal

- Without a noisy signal: Uninformed liquidations never optimal

$$p \cdot WR > sL$$

- A noisy “Bad” signal: wholesale financiers may choose to liquidate when:

$$(p - \theta p) \cdot WR < sL$$

- May be socially suboptimal (signal precise but not so precise)

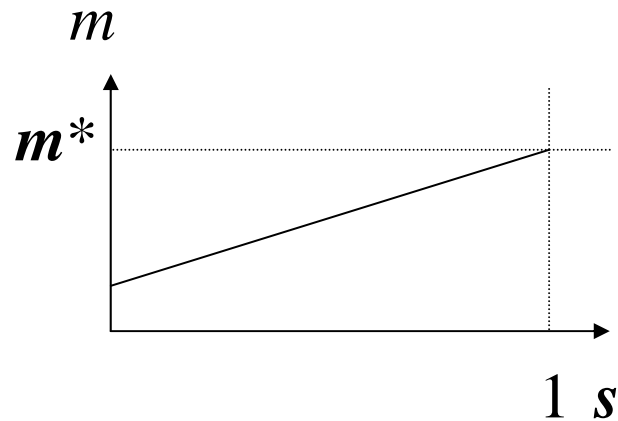
$$(p - \theta p) \cdot X > L$$

- What makes liquidations more appealing? → Higher seniority!

Effects of Seniority

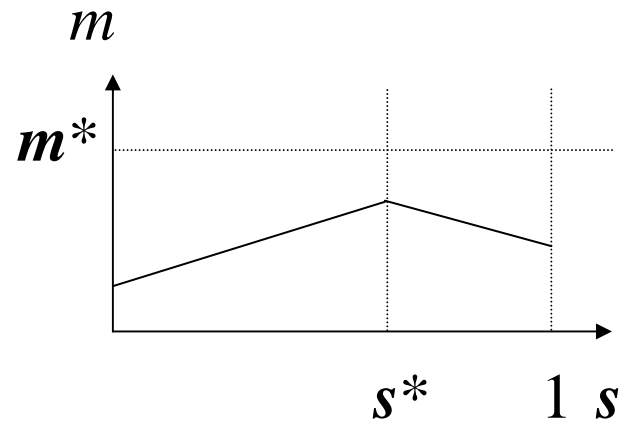
Benchmark: No noisy signal

- Higher liquidation payoff sL
- Higher incentives to monitor
- m^* achieved in $s = 1$



With noisy signal

- Also: Higher incentives to liquidate
- More liquidations \rightarrow less monitoring
- m maximized for $s < 1$



No noisy liquidations

Liquidations after a noisy negative signal

Optimal Seniority for S-T Wholesale Funds

$$s^* = \frac{(1-\theta)pWR}{L}$$

... *lower* for

Risk of “Noisy” Liquidations

$$(1-\theta)pWR < sL$$

... *higher* for

$\theta (+)$ $D (+)$ $W (-)$ $R (-)$ $L (+)$

- **Opaque & illiquid assets:**
High seniority encourages production of information (CK)
- **Liquid assets & relevant public information
(e.g. mortgage banks with MBS):**
Lower seniority encourages private information production and avoids inefficient liquidations
- Consistent with recent events

Summary

Main Results

- A small change to Calomiris and Kahn (1991)
 - Costless but noisy public signal
 - New predictions on optimal seniority
- High seniority of short-term wholesale funds may reduce monitoring, encourage inefficient liquidations
- **Optimal seniority depends on:**
 - Funding structure (e.g. share of deposits / long-term funds)
 - Precision of public signals on project quality (depends on assets)
 - Liquidation value of assets (liquidity buffers / tradeable)
 - Interest rates paid to wholesale financiers
- “Dark side” of wholesale funding consistent with recent events

Incentives of Banks

- **Main analysis**
 - Exogenous funding structure
 - Socially optimal seniority
- 1. **Banks choose funding structure**
- 2. **Seniority determined by:**
 - Sequential service, collateralization, suspension clauses
 - Official resolution procedures
- **Can banks' choices differ from socially optimal?**
 - Yes, when long-term funding is insured or CB bailout likely
 - Too high seniority for wholesale funds (cheaper!)
 - Use of uninformed wholesale funds
- **What can regulators do?**
 - Reduce seniority of wholesale funds (?)
 - Restrict use of wholesale funds by banks(?)

Thank you!!

