Shadow Banking and Market Discipline on Traditional Banks

Anil Ari[1]; Christoffer Kok[2]; Matthieu Darracq Pariès[2]; Dawid Żochowski[2]
[1]International Monetary Fund, [2]European Central Bank

Abstract

We present a model in which shadow banking arises endogenously and undermines market discipline on traditional banks. Demandable deposits impose market discipline: Without shadow banking, traditional banks optimally pursue a safe portfolio strategy to prevent early withdrawals. Shadow banking constitutes an alternative banking strategy that combines high risk-taking with early liquidation in times of crisis. In equilibrium, shadow banks expand until their liquidation causes a fire-sale and exposes traditional banks to liquidity risk. Higher deposit rates in compensation for liquidity risk deter early withdrawals, undermining market discipline on traditional banks. Constrained-optimal policy interventions deter entry into shadow banking.

Motivation

Shadow banks (SB)
- Sector expanded rapidly in the decade before the crisis
- Sudden dry-up of funding and liquidation of assets during crisis
- Fire-sale: Rise in spreads of both safe and risky assets

Traditional banks (TB)
- No withdrawals, expansion in balance sheets
- Portfolio re-allocation from risky to safe and liquid assets
- Rise in funding costs during (and before) the crisis

Simple Model

Financial economy with aggregate risk
- Public signal updates probability of bad state with low asset payoff
- Depositors may find it optimal to withdraw early after bad signal

Key friction: costly commitment
- Banks cannot credibly commit to investing safe
- Commitment cost $\tau > 0$: e.g. reporting costs, opportunity cost of avoiding opaque intermediation processes like securitization

Banks optimally decide between two alternative strategies
- Shadow banking: avoid τ, early withdrawal after bad signal
- Traditional banking: pay τ and stay safe to avoid withdrawal
- Free entry condition pins down relative sector sizes.

Shadow banks (SB)	**Traditional banks (TB)**
Risky portfolio, early withdrawal	Safe portfolio to avoid withdrawal
$E[\Pi^{SB}]$ $= \max(1-q)\,(\sigma_h I_1 + M_1)$ $-\,(1-q)RD$	$E[\Pi^{TB}]$ $= \max(1-q)\,(\sigma_h I_1 + M_1) + q(1$ $-\,p)(\sigma_h I_2 + M_2) - (1-q)(RD+\tau)$

subject to:
$P_1 I_1 + M_1 = D$ (B.C. in period 1)
$P_2 I_2 + M_2 = P_2 I_1 + M_1$ (B.C. in period 2)
$V \geq \frac{1}{p}\left(\frac{1}{R^{TB}} - (1-p)\right)$ (no-withdrawal constraint for TB)

Free entry: $E[\Pi^{SB}] = E[\Pi^{TB}]$ pins share γ of shadow banks

Model with Liquidity Shocks

Idiosyncratic liquidity shocks:
- Probability ξ of involuntary liquidation if $\theta^{TB} > 1$,
- e.g Diamond-Dybvig (1983) bank-run or need to inject cash to project

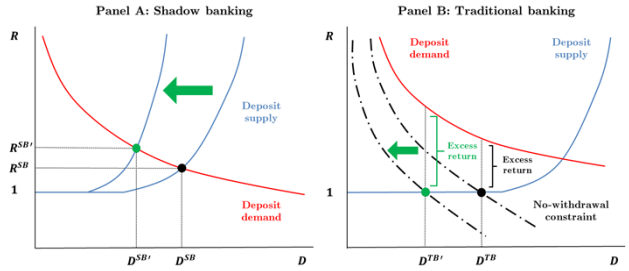
Richer asset span:
- 3 assets: liquid, illiquid safe and illiquid risky separates liquidity from solvency

Market discipline works well without shadow banking
- I Traditional banks use secondary markets to stay liquid
- I Ability to withdraw early leads to market discipline

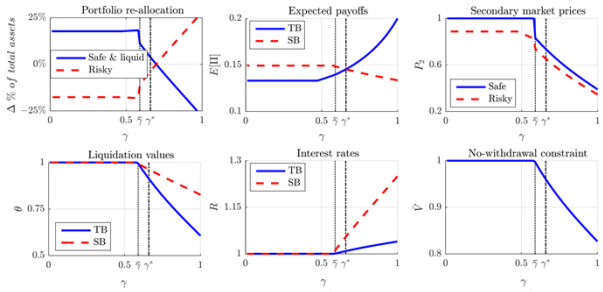
Shadow banking undermines market discipline
- Fire-sale: traditional banks vulnerable to liquidity shocks
- High deposit rates to compensate for liquidity risk
- Reduce incentives to withdraw early, relax constraint

Results

Banking strategies and fire sales
Expansion of shadow banking ($\uparrow \gamma$) exacerbates fire-sale ($\downarrow P_2$)
- SB: increase in borrowing costs, lower profits; TB: tighter constraint, higher profit
- Fire-sale reduces shadow bank profits relative to traditional banks

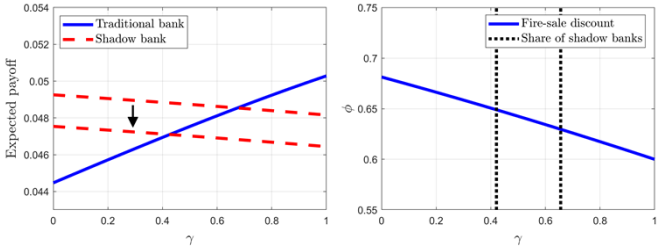


- During crisis, traditional banks re-allocate portfolio toward safe assets
- Shadow banking sector expands until it causes fire-sale
- High deposit rates (due to liquidity risk) undermine market discipline on TB

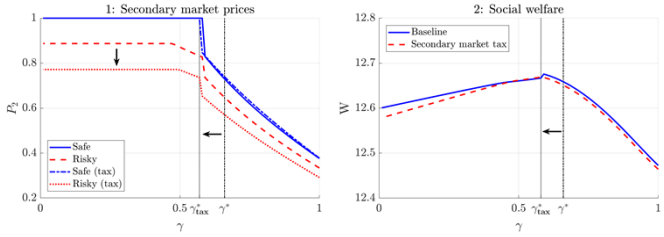


Policy analysis

Pigouvian tax on shadow bank profits (or transfer to traditional banks)
- Offset fire-sale externality in entry into shadow banking
- Reduces the size of shadow banking sector
- Moves the equilibrium to constrained-efficient



Tax on risky assets in secondary market
- Differential tax reduces shadow bank profits, leads to exit
- Alleviate fire-sale on safe assets (risky asset fire-sale adjusts as SB sector shrinks)
- Welfare-raising: schedule shifts down due to tax distortion but sector size closer to social optimal amid time-inconsistency issues



Conclusions

Model of shadow banking without regulatory arbitrage
- Shadow banking as risky banking strategy with free entry
- Expands until it causes fire-sale in equilibrium
- Traditional banks become vulnerable to liquidity shocks
- Market discipline on traditional banks undermined

Contact

Anil Ari
International Monetary Fund
Email: aari@imf.org
Website: www.anil-ari.com/

Dawid Żochowski
European Central Bank
Email: dawid.zochowski@ecb.int
Website: https://www.ecb.europa.eu/pub/research/authors/profiles/dawid-zochowski.en.html