Shadow Banking

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Shadow banking and liquidity transformation

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    i. Regulatory arbitrage
    ii. Neglected risks
    iii. Liquidity transformation

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   - Fragile liquidity, evaporates quickly

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3. Welfare tradeoff (pecuniary externalities)
   - Good times better, bad times worse
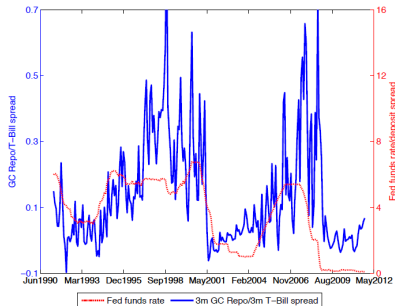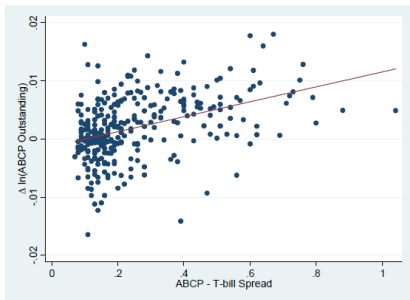   - Rationale for regulation

Demand for money-like claims has grown

Chart 3: Institutional Cash Pools by Type, $ billion
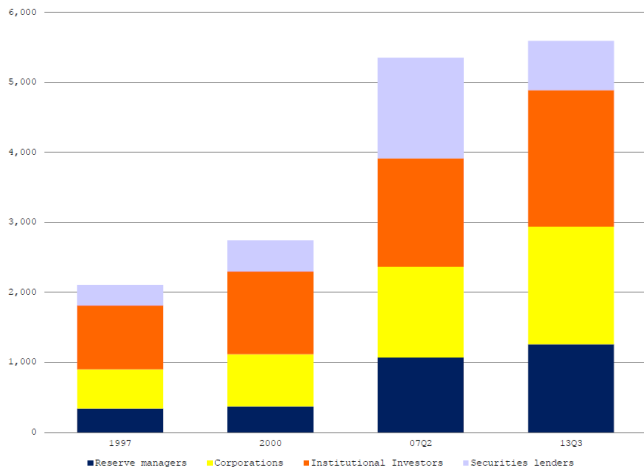
1. Cash pools have limited access to M2 $\Rightarrow$ invest in "shadow money" (Pozsar 2014)

Shadow banking responds to demand for money-like claims
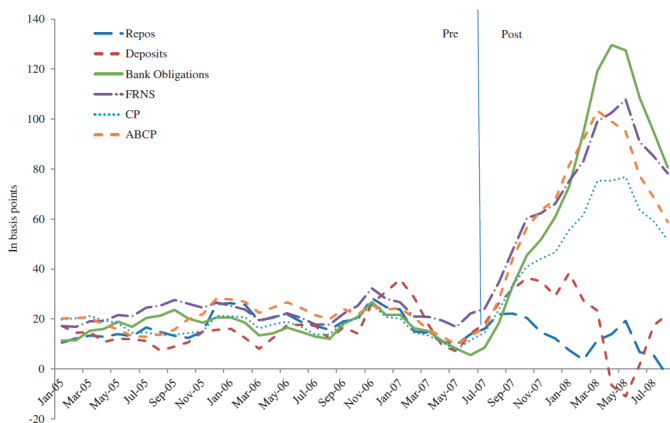

1. Sunderam (2013)
   - ABCP issuance correlated with premium for money-like TBills
   - Can explain half of pre-crisis ABCP issuance

2. Nagel (2014)
   - GC Repo-TBill spread correlated with opportunity cost of money

Shadow money is uncertainty-sensitive

1. Normal-times liquidity that evaporates when uncertainty rises (Kacperczyk and Schnabl 2013)
   - Economizes on collateral when it is more scarce
   - Tradeoff: fragility versus quantity of liquidity

How to regulate the shadows?

1. Command and control: capital requirements, liquidity coverage
   - May backfire due to regulatory arbitrage
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3. Price-based approach: Pigouvian taxation, mandatory insurance
   - Perotti and Suarez (2009); Acharya, Pedersen, Philippon and Richardson (2009)

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4. Public liquidity provision: Fed's reverse repo, floating-rate Treasurys
   - Preserves liquidity supply
   - Emerging consensus: Greenwood, Hanson and Stein (2014); Gorton and Ordonez (2013); Cochrane (2014)
   - Apply Moreira and Savov (2014) to explore how this could work

Crowding out private liquidity transformation

Figure 3. Impact of government supply on financial sector balance sheet, 1914–2011
Panel A. Impact on short, long, and equity net categories
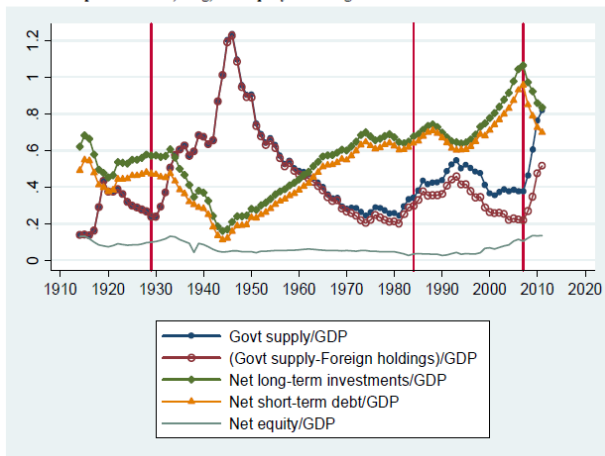
1. Krishnamurthy and Vissing-Jorgensen (2013)
   - Government debt negatively related to ST debt in financial sector

Moreira and Savov (2014) in a nutshell

1. Households demand liquid securities to self-insure against shocks
   - Liquidity ⇔ low information sensitivity

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2. Intermediaries invest in (safe/risky) real capital and finance with
   - Money m_t safe $\Rightarrow$ liquid
   - Shadow money s_t safe except in a crash $\Rightarrow$ liquid except in a crash
   - Equity residual $\Rightarrow$ illiquid

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3. Collateral constrains liquidity provision, quantity vs. fragility tradeoff

$$\text{Money} \times 1 + \frac{\text{Shadow}}{\text{money}} \times \left(1 - \frac{\text{Crash}}{\text{loss}} \right) \leq \frac{\text{Bank}}{\text{assets crash}} \text{value}$$

$$m_t + s_t \left(1 - \overline{\kappa} \right) \ \leq \ 1 - \kappa_{A,t}$$

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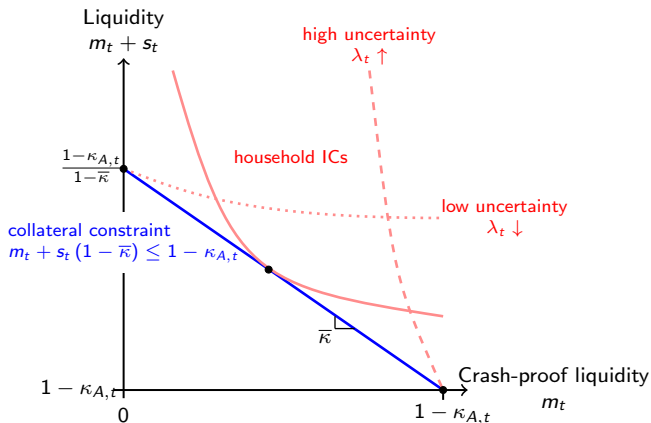3. Collateral constrains liquidity provision, quantity vs. fragility tradeoff

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4. Uncertainty drives demand for crash-proof vs. crash-fragile liquidity
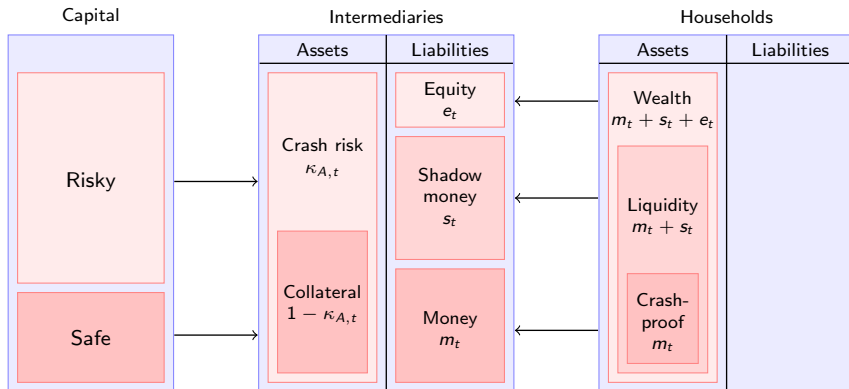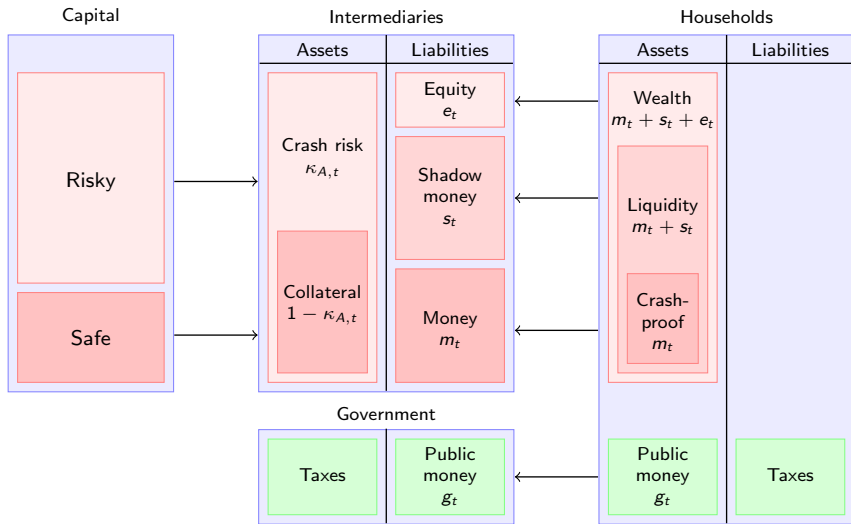
Moreira and Savov (2014) equilibrium

- Collateral supply $1 - \kappa_{A,t}$ limits overall liquidity provision
- Optimal mix pinned down by uncertainty λ_t

Balance sheets

Balance sheets with "tax-backed" public money

Equilibrium with "tax-backed" public money

- Spreads

$$\mu_{e,t} - \mu_{m,t} \quad \propto \quad e^{-\tau\lambda_t} e^{-\eta(g_t + m_t + s_t)} + \left(1 - e^{-\tau\lambda_t}\right) e^{-\eta(g_t + m_t)}$$
$$\mu_{s,t} - \mu_{m,t} \quad \propto \quad \left(1 - e^{-\tau\lambda_t}\right) e^{-\eta(g_t + m_t)}$$

- Collateral constraint

$$m_t + s_t \left(1 - \overline{\kappa}\right) \quad \leq \quad 1 - \kappa_{A,t}$$

- Public money lowers discount rates
  - Does NOT directly affect incentive to produce shadow money

- Indirect effect through collateral values
  - Raises collateral values if expected to remain in place in bad times,
    e.g. deposit insurance, TBills, floating-rate Treasurys
  - Lowers them if it disappears, e.g. stigma, fiscal/political constraints
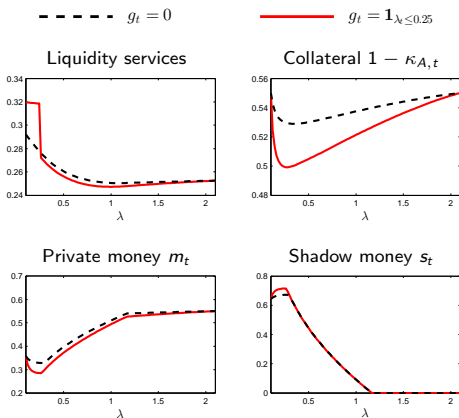
"Tax-backed" public money
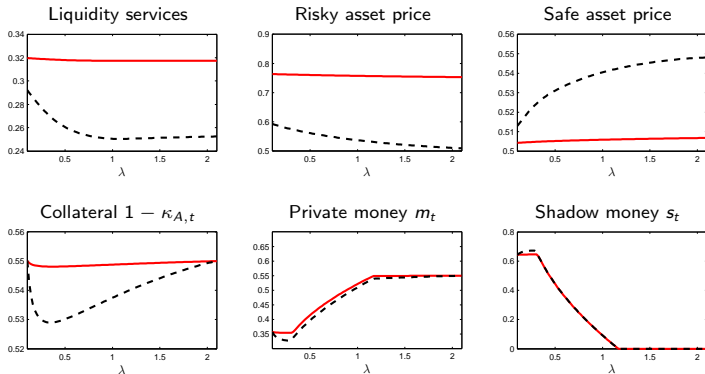
Value-weighted capital mix 75% risky.

- Permanent fiscal expansion $\Rightarrow$ stable liquidity supply $\Rightarrow$ greater collateral values $\Rightarrow$ crowds private money <u>in</u>, shadow money <u>out</u>

"Tax-backed" public money in good times only

$g_t = 0$ $\quad$ $g_t = \mathbf{1}_{\lambda_t \leq 0.25}$

Liquidity services

Collateral $1 - \kappa_{A,t}$

Private money m_t

Shadow money s_t

Value-weighted capital mix 75% risky.

- Liquidity crunch in crisis $\Rightarrow$ collateral values lower ex ante
  - Collateral runs (margin spirals) depress liquidity below level with no public money
- Crowds private money <u>out</u>, shadow money <u>in</u>
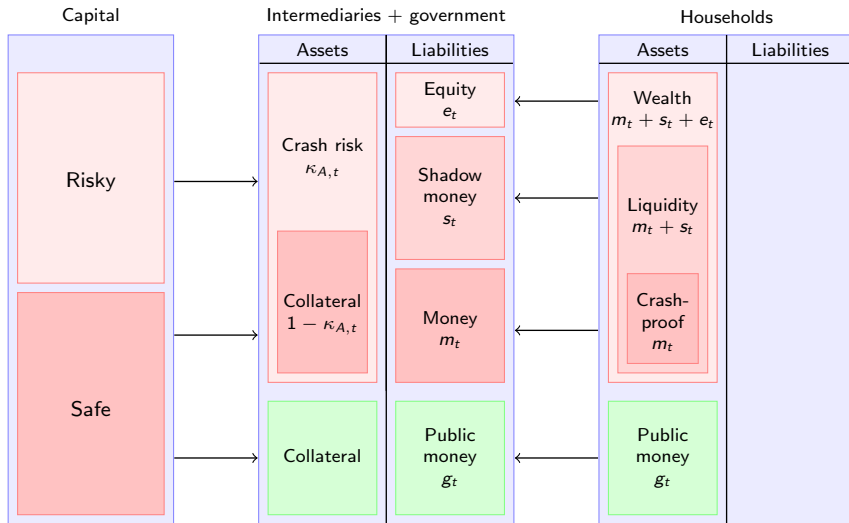
"Asset-backed" public money

- Taxation power + commitment
  - Government not subject to collateral constraint unlike private sector
  - Allows for greater liquidity provision
  - Distortions due to taxes, redistribution
  - E.g. deposit insurance

- Fed lacks taxation power
  - Monetary policy via open market operations
  - Uses assets to back liabilities
  - E.g. Fed's reverse repo

- Two types of liquidity policy
  - Fiscal = tax-backed
  - Monetary = asset-backed
  - Trade off: cost of taxation versus effectiveness

Balance sheets, "asset-backed" public money
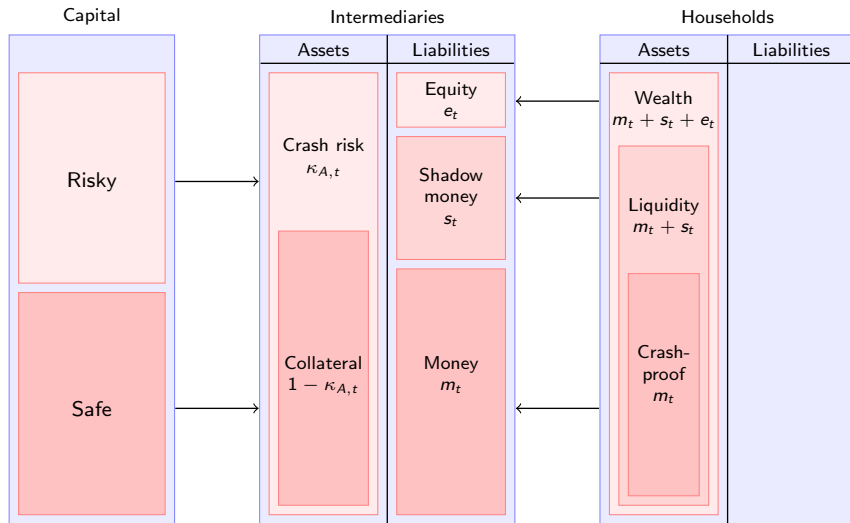
Balance sheets, "asset-backed" public money

Equilibrium with "asset-backed" public money

- Collateral constraint

$$m_t + s_t \left(1 - \overline{\kappa}\right) \quad \leq \quad 1 - \kappa_{A,t}$$

- If Fed buys safe asset, private sector collateral $1 - \kappa_{A,t}$ falls
  - The financial sector shifts to shadow money
  - Intuition: public money crowds out closest substitute, private money
  - Even total collateral (Fed + banks) can fall if safe asset has flight to quality (negative beta, e.g. Treasurys).

- If Fed buys risky asset, private sector collateral $1 - \kappa_{A,t}$ rises
  - Requires taxes to back potential losses
  - The financial sector shifts to money
  - Taxes as additional "collateral", (Fed ultimate "shadow bank")

"Asset-backed" public money

- - - · No public money   —— Public money
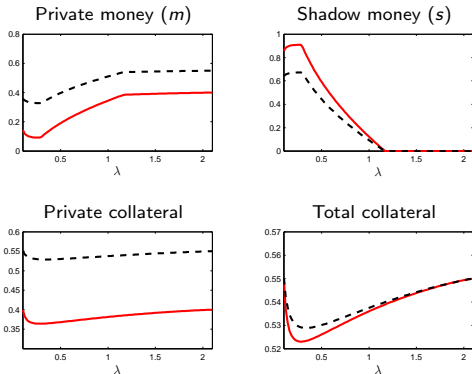
Value-weighted capital mix 75% risky. Public money backed by stock of safe asset.

- Public money backed by safe asset ⇒ Less collateral in private hands ⇒ Shift to shadow money
- Excess collateral at Fed wasted ⇒ Less overall collateral, liquidity

Takeaways

1. Emerging consensus for public money to crowd out shadow banking. But...
   - Public money substitute for fully safe securities, e.g. bank deposits
   - Can lead financial sector to substitute toward shadow banking
   - Especially true if public money backed with safe assets

2. Tax-backed public money, e.g. floating-rate debt expands liquidity supply
   - Directly by increasing collateral supply
   - Multiplier effect by increasing collateral values
   - Requires counter-cyclical taxation or deficits

3. A possible combination: risky-asset backed reverse repo
   - Trades off cost of taxation and effectiveness