Discussion of De Fiore, Hoerova and Uhlig: 'The Macroeconomic Impact of Money Market Disruptions'

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ECB workshop on money markets, monetary policy implementation and central bank balance sheets

Overview of the model

A dynamic general equilibrium model with:

- Two types of banks (GK 2011) subject to liquidity shocks
  1. Connected banks have access to unsecured markets
  2. **Unconnected banks** do not; need to insure by holding
     - Government bonds
     - Reserves
- Two types of interbank markets
  1. Unsecured market
  2. **Secured market**
- **Central bank discount window**
- Multiple occasionally binding constraints

Main results: significant role of money markets

Permanent disruptions in:

1. **Secured market**
   - Private haircuts (3 to 45%) $\rightarrow$ Output down by **0.65**%
2. **Unsecured market**
   - No access to unsecured markets (58 to 76%) $\rightarrow$ Output down by **0.5**%
3. **Fears of deposit withdrawals**
   - Share of deposit withdrawals (0.1 to 0.2) $\rightarrow$ Output down by **3**%

Monetary policy can mitigate these negative effects, but it's not a panacea

It's all about the supply of bank credit to the real economy

To capture the mechanisms,...a simple two-period model

Environment:

- Christiano and Ikeda (2013)
- Two period, t=1,2
- Households and banks
- Endowment: $\bar{y}$ (HH income); $\bar{n}$ (bank capital)

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$$\max_{\{c_1, c_2, d\}} u(c_1) + c_2$$

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Solution: supply curve of funds

$$R = u'(\bar{y} - d)$$

A simple two-period model: banks

- A fraction ξ of banks are 'connected'
- Banks have access to linear loan technology of return $\bar{R}^k$

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Connected banks

$$\max_{\{d_c\}} \bar{R}^k(\bar{n}_c + d_c) - Rd_c$$

$$\text{s.t.} \quad Rd_c \leq (1-\lambda)\bar{R}^k(\bar{n}_c + d_c)$$

Demand for funds:

$$d_c = \frac{(1-\lambda)\frac{\bar{R}^k}{R}\bar{n}_c}{1-(1-\lambda)\frac{\bar{R}^k}{R}}$$

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Unconnected banks

$$\max_{\{d_u,b\}} \bar{R}^k(\bar{n}_u + d_u - b) + R^b b - Rd_u$$

$$\text{s.t.} \quad Rd_u \leq (1-\lambda)\bar{R}^k(\bar{n}_u + d_u)$$
$$\bar{\omega} d_u \leq \tilde{\eta} b$$

Demand for funds:

$$d_u = \frac{(1-\lambda)\frac{\bar{R}^k}{R}\bar{n}_u}{1-(1-\lambda)\left[\frac{\bar{R}^k}{R} - \left(\frac{\bar{R}^k - R^b}{R}\right)\frac{\bar{\omega}}{\tilde{\eta}}\right]}$$

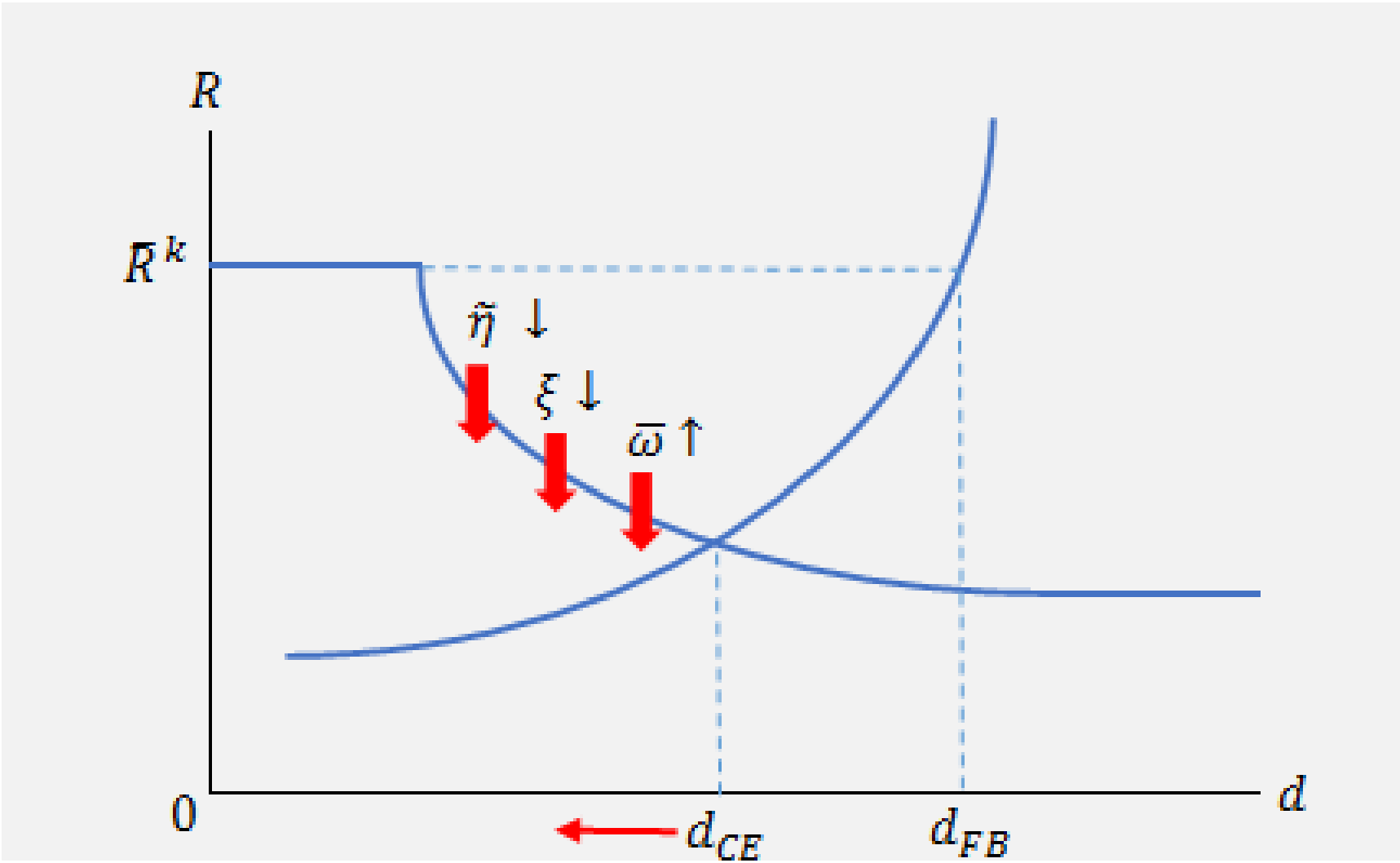
A simple two-period model: equilibrium

- Market clearing: $d = d_c + d_u$
- Supply of bank credit: $d^s = (\bar{n}_c + d_c) + (\bar{n}_u + d_u - b)$

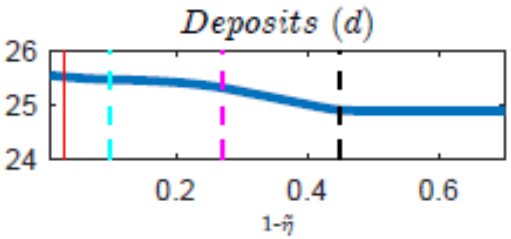
$$d^s = \left\{ 1 + \frac{(1-\lambda)\frac{\bar{R}^k}{R}\xi}{1-(1-\lambda)\frac{\bar{R}^k}{R}} + \frac{(1-\lambda)\frac{\bar{R}^k}{R}(1-\xi)\left(1-\frac{\bar{\omega}}{\tilde{\eta}}\right)}{1-(1-\lambda)\left[\frac{\bar{R}^k}{R}-\left(\frac{\bar{R}^k-R^b}{R}\right)\frac{\bar{\omega}}{\tilde{\eta}}\right]} \right\} \bar{n}$$

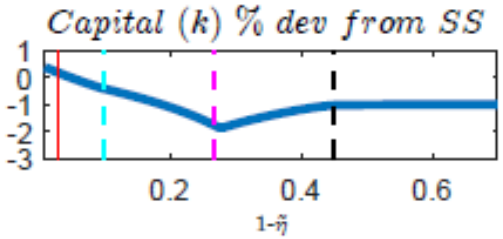
1. An increase in haircut $(\tilde{\eta} \downarrow) \rightarrow d^s \downarrow$
2. A drop in unsecured market access $(\xi \downarrow) \rightarrow d^s \downarrow$
3. An increase in deposit withdrawals $(\bar{\omega} \uparrow) \rightarrow d^s \downarrow$

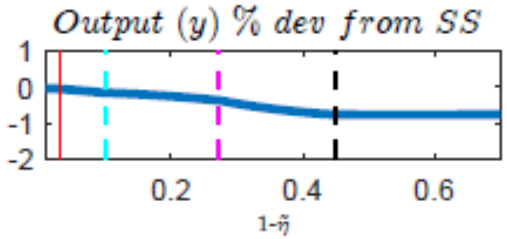
A simple two-period model: graphical representation



Comment 1: Effects of central bank funding







- In the region of no central bank funding, $\tilde{\eta} \downarrow \rightarrow d \downarrow$, $k \downarrow$, $y \downarrow$
- These are consistent with the implications of the simple model
- In the region of central bank funding, why $\tilde{\eta} \downarrow \rightarrow k \uparrow$ while $d \downarrow$, $y \downarrow$?
- Connected banks' lending increases significantly in the region; why?

Comment 2: Sources of shocks (changes)

- Changes in $\tilde{\eta}$, ξ and $\bar{\omega}$ capture 'financial' shocks (shocks to λ)
- The paper disentangles the effects of $\tilde{\eta}$, ξ and $\bar{\omega}$, but this is not the end of story
- These changes are likely to be related
- Sovereign debt crisis $\rightarrow$ **haircuts up** $\tilde{\eta} \downarrow$, losses to banks
  $\rightarrow$ solvency concern $\rightarrow$ **shrink in unsecured market** $\xi \downarrow$
  $\rightarrow$ ...
- Empirical evidence: Buera and Karmaker (2017)
- Model of interbank contagion for stress tests: Bardoscia et al (2017)

Comment 3: Permanent or temporary changes

- If changes in $\tilde{\eta}$, ξ and $\bar{\omega}$ are permanent, SS analysis is appropriate
- Temporary: haircuts ($\tilde{\eta}$) and maximum deposit withdrawals ($\bar{\omega}$)
- Permanent?: shrink in unsecured market (ξ)
- Possible other causes (Euro money market study 2014)
  - Regulations
  - Unconventional monetary policy; low interest environment
- SS analysis is useful, but the results should be taken with caution

Comments on policy

Inflation and monetary policy

- Inflation rises when
  - banks' demand for reserves goes up
  - banks are indifferent between holding bonds and reserves
- Mechanism: inflation rises to make households shift away from money
- This may not be a good description of inflation under 'liquidity trap'

Central bank funding

- In the model, banks have to borrow from central banks in advance
- What if banks pledge collateral and freely borrow up to the pledged value later?

Very interesting paper

Thank you very much