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

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6 November 2017

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

The views expressed in this presentation are those of the author and should not be interpreted as those of the Bank of England.

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

$$\text{s.t.} \qquad c_1 + d = \bar{y}, \qquad c_2 = Rd + \pi$$

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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:

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

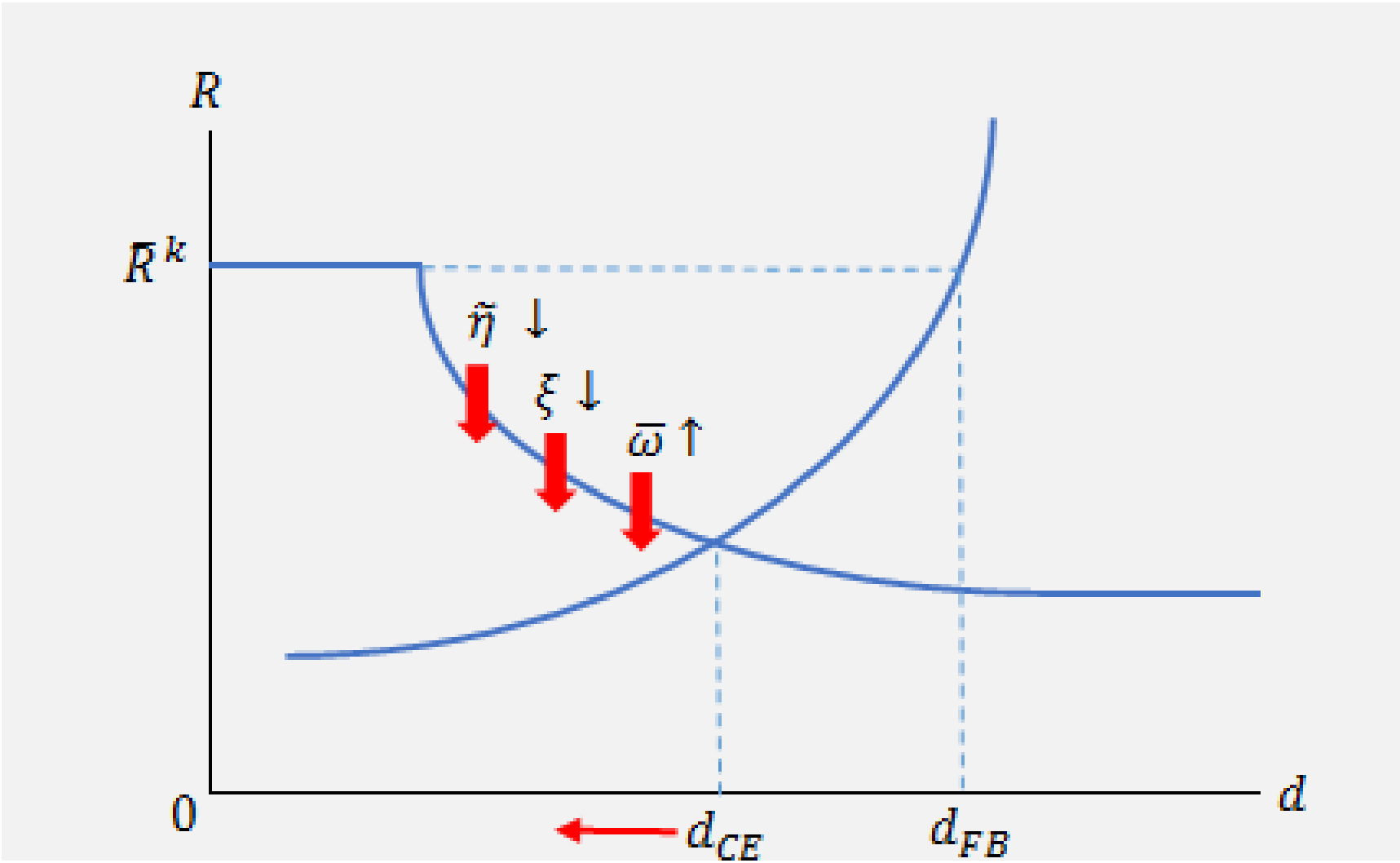
A simple two-period model: equilibrium

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

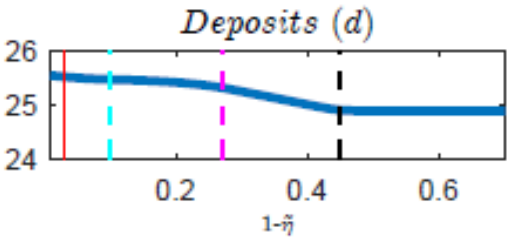
$$d^s = \left\{ 1 + \frac{(1-\lambda)\frac{\bar{R}^k}{R}\xi}{1-(1-\lambda)\frac{\bar{R}^k}{R}} + \frac{(1-\lambda)\frac{\bar{R}^k}{R}(1-\xi)\left(1-\frac{\bar{\omega}}{\tilde{\eta}}\right)}{1-(1-\lambda)\left[\frac{\bar{R}^k}{R}-\left(\frac{\bar{R}^k-R^b}{R}\right)\frac{\bar{\omega}}{\tilde{\eta}}\right]}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

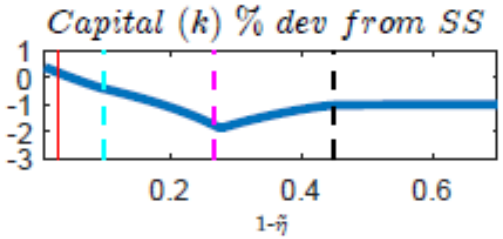
1. An increase in haircut $(\tilde{\eta} \downarrow) \rightarrow d^s \downarrow$
2. A drop in unsecured market access $(\xi \downarrow) \rightarrow d^s \downarrow$
3. An increase in deposit withdrawals $(\bar{\omega} \uparrow) \rightarrow d^s \downarrow$

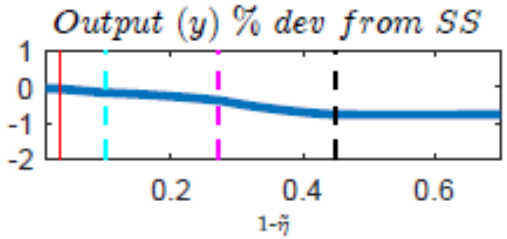
A simple two-period model: graphical representation



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