

Monetary Policy in a Channel System

Discussion

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Summary

- Dynamic general equilibrium model in the tradition of Lagos and Wright (2005)
 - where use of both **money** and **collateralised credit** are micro-founded and arise in equilibrium.
- At the same time, model captures key institutional features of modern
 - **Payment systems**
 - **Money markets**
 - **Standing facilities**
- Model used to analyse the interplay between these elements when monetary policy is implemented through a Channel system

Payment system

- Banks are subject to liquidity shocks that arise as (customer) payments flow between banks.
- With probability n agent (bank) will want to produce (is long liquidity).
- With probability $(1-n)$ agent (bank) will want to consume (is short liquidity).
- Since payment shocks are largely offsetting in aggregate, the case of $n = \frac{1}{2}$ (or close) is most relevant.

Interbank money market

- In the presence of uncertainty about end-of-day position, banks can borrow or lend money in an interbank money market (to avoid use of standing facility).
- Since interbank loans are subject to credit risk, a bank can borrow funds (money) only up to the present value of available **collateral**
 - Collateral is costly since its present discounted real return is less than its cost of production $\beta R < 1$.
 - But collateral is valued because it increases liquidity.

CB Standing facilities

- Lending facility, at i_l
 - Banks can borrow from CB, against collateral, to cover any shortage not covered by borrowing in the money market
- Deposit facility, at i_d
 - Banks can deposit with CB any funds not traded away in the money market
- $B = i_l - i_d$ is the spread implied by the interest corridor (or channel). The policy rate, i_p is defined as its mid-point.

Key results and implications for policy

- The central banks optimally sets a positive spread, $\beta > 0$. Intuition:
 - It is never optimal to set a spread of zero.
 - In this case banks do not keep any money (there is no interbank money market)
 - And all liquidity needs are satisfied through borrowing from the central bank, against collateral.
 - But carrying collateral is costly, while money can be produced at no cost.

Key results and implications

$$i_m = i_l - n\beta R\delta$$

- The money market rate is above the policy rate (as observed in practice (eg UK, Euro area) and is increasing in the cost of collateral (decreasing in R).
 - If $n=1/2$
 - then if $\beta R=1$, the money market rate is equal to the policy rate.
 - but if $\beta R<1$, the money market rate is above the policy rate.
- In addition, more costly collateral reduces welfare.
 - Relevant to policy debate: While the cost of collateral is given (exogenous), this strengthens the case for CBs to extend their list of eligible collateral across currencies or along the credit spectrum
 - both in normal times and in stress times.

Key results and implications

$$i_m = i_l - n\beta R\delta$$

- Around $n=1/2$, an **increase in n** (a bigger aggregate liquidity surplus) reduces the money market rate towards the policy rate, while a **reduction in n** (liquidity shortage) pushes the market rate up.
- In practice, central banks use **OMOs** to attempt to achieve a situation where $n=1/2$ (or close).
 - **Case study:** UK OMO at 10 am of 28 June was underbid by £5.4 billion. When this was announced, overnight secured spreads relative to Bank Rate shot up by nearly 100bp (BoE Quarterly Bulletin Q3 2007).

Key results and implications

- The link between n and i_m also illustrates a link between payment system functionality and monetary policy operations:
 - **Operational problems** in RTGS systems may lead to a liquidity sink (the bank being able to receive, but not to pay).
 - This can lead other banks to (expect) to be short at the end of the day (**low n**) and push overnight rates up. Klee (2007)
- Low n may be thought of more generally as metaphor for banks' incentive to hoard liquidity.

Key results and implications

- Increase (reduction) in the policy rate and a symmetric increase (reduction) in the spread have **equivalent effects** on inflation, consumption and welfare.
 - Increase in policy rate increases inflation but reduces consumption and welfare in this type of model.
- **Not so sure:**
 - Both reduction in policy rate and reduction in spread (discount rate) amount to loosening.
 - But central banks use the former to affect the medium term outlook for inflation (as transmitted eg through a standard interest channel to the broader economy)
 - And they use the latter (rarely) to accommodate short-run liquidity stress in the banking system.
 - Conjecture: The two may be equivalent when bank lending channel is particularly important in the transmission of a shock (in crisis times).

Issues for further research

- What determines the **volatility** of the market rate in channel systems?
 - Equations suggest that volatility in n may result in greater volatility in rates when the spread is high. Can this be shown formally, empirically?
 - How do other features of the regime (frequency of OMOs, reserve averaging, remuneration of reserves) affect volatility?
- Model **unsecured** market alongside **secured**.
 - Could explore how changes in credit risk and cost of collateral affect unsecured and well as secured rates.
- How do the effects of an increase in the policy rate and an increase in the spread differ depending on the **type of shock** to the economy?

Overall verdict

- Paper pushes the frontier in modelling linkages between
 - Payment systems,
 - Interbank markets
 - Monetary policy.
- At the same time
 - framework is tractable
 - could become a workhorse for further research in this area
- A great paper!