Discussion

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The paper by Morten Bech and Cyril Monnet considers the interbank market during and after the global financial crisis (GFC), characterising it by four stylised facts:

1. The higher the level of excess reserves, the lower the overnight interest rate.
2. The higher the level of excess reserves, the lower the dispersion of overnight interest rates.
3. The higher the level of excess reserves, the lower the volume of trade in the overnight interbank market.
4. Larger counterparty risks increase the overnight interest rate.

The authors present a single model which can simultaneously explain many of these observed features. This is central to its valuable contribution.

Contribution to the literature

Often these four facts are considered to be obvious but, on reflection, some explanation is necessary. For someone unfamiliar with the reserve system, the fact that the central bank can control the overnight interest rate in a linked interbank market is not a trivial matter. Also, simple supply and demand conditions do not say anything about heterogeneity – for example, in interest rate volatility or trade volumes – so a separate model is needed to explain these facts.

The authors' significant achievement is to construct a framework to examine how well various models can explain these facts. By presenting the model in the context of the previous literature, the authors helpfully illustrate the development of thinking in this field. Accordingly, the framework will serve as a useful tool for understanding the interbank market, and aid thinking about the effectiveness of unconventional monetary policy in the future.

Model mechanisms and intuition

Poole

The intuition that underlies the various models can be seen by assuming, for simplicity of analysis, but without loss of generality, that the target level of reserves for commercial banks is zero. Poole (1968) considers before-trade and after-trade shocks. Monetary policy controls banks' initial reserve positions and after-trade shocks prevent banks from fully matching their reserve demand through interbank trade in the overnight market. Another feature is the corridor system, which comprises two official interest rates: the deposit rate, r^D, and the lending rate, r^W, with $r^W > r^D$. If, following an after-trade shock, a bank has a negative reserve position, it pays r^W. Conversely, if it has a positive reserve position, it is remunerated at the lower deposit rate, r^D. The key equation in the model involves equating, by (statistical) arbitrage, the interbank interest rate, r^A, to the expected *ex post* interest rate that the commercial bank faces in the corridor system. That is:

$$r^{\Delta} = r^{W} * \Pr(negative) + r^{D} * \Pr(positive). \quad (1)$$

If all banks expect to be in the positive region following the after-trade shock, the interest rate in the overnight market must be r^D. If, on the other hand, banks expect the converse to hold, the interbank rate must be r^W, the lending rate. Depending on the reserve position, the interbank rate should move between these levels. This market clearing mechanism captures the relationship between quantity and price. Increasing the initial holding of reserves via unconventional monetary policy will naturally increase the volume of excess reserves and reduce the probability that banks settle in the negative region. This yields the first result: the higher the excess reserves, the lower the overnight interest rate.

However, the competitive market clearing condition yields a single overnight rate, which implies that the model is silent about the volatility of overnight rates. Furthermore, trade volumes are pinned down only by the dispersion of the before-trade shock, and therefore the model can say nothing about unconventional monetary policy. Nor does the model address counterparty risk.

Afonso and Lagos

In Afonso and Lagos (2012), banks trade bilaterally after shocks hit the economy. There is no need for after-trade shocks, since decentralised trade results in position heterogeneity. Interbank trade involves matching the reserve positions of banks. In the absence of an aggregate market clearing condition, Nash bargaining produces heterogeneous interest rates through the random matching of banks that have different positions after shocks. In each trade, banks determine the rate they are prepared to pay by considering their post-trade reserve position, and in particular whether they will be above target.

In this model, if the initial reserve position is very large (small), then all the banks end up with positive (negative) reserve positions, and thus all traded interest rates are the deposit rate r^D (the lending rate r^W), with no dispersion. Thus the model can explain the second stylised fact: the higher the level of excess reserves, the lower the dispersion of overnight interest rates.

However, with regard to the third stylised fact, shocks will create heterogeneous reserve positions and thus trade occurs irrespective of the initial positions as determined by unconventional monetary policy. The model identifies no clear relationship between excess reserves and trade volumes. Counterparty risk is again not covered in this model.

Bech and Monnet

The trick in Bech and Monnet (2013) is that trade happens only between banks with positive and those with negative positions. In Afonso and Lagos (2012), irrespective of how high a reserve position a bank has, any meeting between banks with differing positions will lead to trade. Here, by comparison, if the banks already both have positions above the target level, there is no need to undertake trade, since both are already meeting the target. This delivers the conclusion that as the volume of excess reserves increases, trade volumes fall. This simple additional restriction on trade allows the model to explain the first three stylised facts.

Default risk is also incorporated into the model. As default risk increases the cost of lending, the interest rate banks lend at accordingly rises. The paper refers to this as a risk premium, although technically it appears to be a credit spread to offset downside risk.

Comments

The model in Bech and Monnet (2013) nicely explains the stylised facts, and could be a benchmark model for positive analysis to understand the interbank market theoretically. From this positivist perspective, I have no substantive comments to make. However, several comments can be made about the normative implications of the model and the implementation of unconventional monetary policy.

The model considers how unconventional monetary policy affects interbank interest rates, dispersion of interest rates, and trade volumes in the overnight interbank market. Normative implications are outside the scope of the paper, since there is no modelled distortion in the interbank market. The stance of the paper appears to be that distortions exist outside the interbank market, and a new form of monetary policy is needed to tackle these distortions. However, it is not clear that there are no distortions in the interbank market.

Rather, unconventional monetary policy seems to be, at least in part, intended to address the functioning of the interbank market, in addition to macroeconomic considerations. It is questionable whether the sharp rise in the LIBOR-OIS spread was an optimal outcome for banks. Having said this, it is difficult to identify excessive risk aversion by banks, and it is unclear whether public policy should be used to reduce excessive risk premia in financial markets if they simply reflect agents' preferences. Normatively speaking, if such distortions could be evaluated, there is a case to consider costs versus benefits. The costs of unconventional monetary policy tend to be ignored, but there must be substantial costs in terms of legal costs or overtime of central bank employees. It would be desirable to know how large these are compared with the gains from eliminating distortions.

Finally, in the model, unconventional monetary policy is simply the control of original reserve positions, which presents no difficulty here. However, there are many variations of unconventional monetary policies to increase excess reserves.[1] Central banks also seem to care about which assets to purchase, an aspect missing from the paper. Also, increasing excess reserves becomes less trivial when considering stigma, which will tend to prevent central banks from extending excess reserves to those that need them most. This stigma issue is a potentially interesting mechanism design question in the future.

References

Afonso G and R Lagos (2012), 'Trade Dynamics in the Market for Federal Funds', Federal Reserve Bank of New York Staff Report No 549.

Bech ML and C Monnet (2013), 'Directed Search in the Interbank Money Market', Paper presented at the European Central Bank Workshop on 'Structural Changes in Money Markets: Implications for Monetary Policy Implementation', Frankfurt, 30 September–1 October.

Poole W (1968), 'Commercial Bank Reserve Management in a Stochastic Model: Implications for Monetary Policy', *The Journal of Finance*, 23(5), pp 769–791.

1 For example, at the Federal Reserve, these include the Term Auction Facility (TAF), Primary Dealer Credit Facility (PDCF), Term Securities Lending Facility (TSLF), Asset-backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF), Commercial Paper Funding Facility (CPFF), Money Market Investor Funding Facility (MMIFF) and Term Asset-backed Securities Loan Facility (TALF).

2. General Discussion

Much of the discussion of this paper followed from a comment that both the model and experience demonstrated that excess liquidity provision by central banks could crowd out private bank activity in the overnight market. Although control of the interest rate would be retained in a corridor system in these circumstances, several participants noted that excess reserves could increase to the point that there was no trade in the interbank market. One consequence of this was a decline in the monitoring of counterparties, which was an inherent feature of trade in the overnight market.

One participant inquired as to what this might mean for the optimal monetary policy framework. New Zealand was cited as an example of a country that had adjusted its operations with regard to paying interest on reserves because this loss of trade in interbank markets was perceived as being too costly. Morten Bech responded that the role of monitoring had not been considered in the model presented in the paper, but agreed that interbank monitoring was a positive feature of the corridor system. He suggested, however, that the benefits of monitoring needed to be weighed against the benefits to the payment system that arose from paying interest on reserves; the payment system would be expected to operate more smoothly because reserves were available for use intraday in the payment system, making banks less inclined to delay their payments. Dr Bech demurred from taking a position on which system was optimal since the model's view of unconventional monetary policy was focused on the effects of the asset purchase programs, and did not speak directly to this issue. In addition, Dr Bech noted that the models in the paper did not say anything about the appropriate management of the corridor. He added that intervention had aimed to reduce volatility within the corridor, but the effect of market size on volatility was not yet well understood.

Several participants observed that while the model provided useful insights into the implications of the increase in excess reserves, it did not consider other aspects of unconventional monetary policy, such as forward guidance from the Federal Reserve about its exit from holding non-standard assets. Dr Bech agreed that unconventional monetary policy comprised a much broader set of instruments, but noted that his paper had intentionally restricted its focus to the sharp rise in excess reserves as an endogenous by-product of purchase programs targeting the long end of the yield curve.

One participant raised a potential empirical issue relating to the paper's fourth stylised fact that the rate a bank had to pay in the interbank market tended to rise with its risk of default. The participant cautioned that the average rates charged in the interbank market could be misleading in high-stress situations due to self-selection; where banks were shut out of unsecured funding markets, or faced punitive rates for such funding, they might instead access funding through the secured market or the central bank. Indeed, average interbank rates charged in the euro area had fallen on particularly high-stress days during the crisis. The participant then asked whether banks' choice of funding source could be included in the model. Dr Bech responded that modelling this empirically would require highly disaggregated trade data. He emphasised that an attractive feature of the model was that with sufficiently high credit risk, interbank markets tended to disappear, and this occurred irrespective of the level of excess reserves.