

COMMENT

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MONETARY POLICY OPERATIONS EXPERIENCES DURING THE CRISIS AND LESSONS LEARNT

I INTRODUCTION

The papers by Cassola, Durré and Holthausen and Hilton and McAndrews offer two complementary perspectives on how the ECB and the Federal Reserve responded to the crisis, and the lessons that these experiences provide for the future design of the operational framework of monetary policy on both sides of the Atlantic.

I would like to start by noting that both central banks shared the same fundamental structure, based on a separation between the decisions on the policy rate – taken by the Governing Council of the ECB and the Federal Open Market Committee (FOMC) of the Federal Reserve respectively – and the decisions on liquidity provision designed to keep very short-term interest rates, such as EONIA and the Federal Funds rate, close to the policy rate. In the case of the ECB, this *separation principle* has its institutional correspondence in the allocation of tasks between the Governing Council, which is responsible for the formulation of the monetary policy of the Eurosystem, and the Executive Board, which is responsible for its implementation. In the case of the Federal Reserve, it corresponds to the allocation of tasks between the FOMC and the Federal Reserve Bank of New York.

However, prior to the crisis there were very important differences between the ECB and the Federal Reserve in terms of implementation of monetary policy. First, the open market operations of the ECB were conducted in a decentralised manner, through the national central banks of the Eurosystem, normally once a week and with a large number of counterparties, whereas the Federal Reserve Bank of New York traded every day with a few primary dealers. Second, minimum reserves were fairly small in the United States, and until October 2008 they were not remunerated,¹ while the Eurosystem had large reserve requirements remunerated at market rates. Third, until January 2003 the Federal Reserve's discount window rate was below the policy rate, and using the window carried a stigma that made it a last-resort source of liquidity. In contrast, the ECB's marginal lending facility rate had always been above the policy rate and carried no stigma. Finally, the ECB had a deposit facility, whereas the Federal Reserve had none.

1 The 2006 *Financial Services Regulatory Relief Act* contemplated the payment of interest on reserves from October 2011, but the 2008 *Emergency Economic Stabilization Act* advanced this date to October 2008.

The changes adopted by the Federal Reserve in January 2003 and October 2008 moved the US framework toward the Eurosystem framework in two important respects: first, a lending facility was introduced with a discount rate (renamed the primary credit rate) set initially at 100 basis points above the policy rate, and second, an “automatic” deposit facility was introduced as a result of the decision to pay interest on excess reserves.

Still some important differences remained. First, working with a very small number of counterparties meant that when the normal functioning of the money markets broke down, it was much more difficult for the Federal Reserve to get the liquidity flowing to the banks that needed it, as compared to a system where these banks could directly access the central bank. Second, using a restricted set of collateral assets – basically US Treasury securities – meant that when the primary dealers ran out of these assets the Federal Reserve did not have the instruments to inject the required liquidity into the system. Finally, despite the changes in the US discount window policy, the stigma problem lingered, so many banks were reluctant to use the window.² These differences help to explain how in many of its operational decisions the Federal Reserve seemed to be a more “innovative” central bank, but the fact is that the ECB had at its disposal a better set of tools to handle a liquidity crisis.

During the crisis, investors withdrew large amounts of funds from some financial institutions and placed them in other institutions, and/or purchased financial assets such as government securities. Thus, some institutions had liquidity deficits and others had liquidity surpluses. In normal conditions, such portfolio shifts could have been managed by deficit institutions either by selling assets to, or by borrowing from, surplus institutions. The problem was that deficit institutions ran out of government securities and credit markets stopped functioning, owing to a lemons problem, so there was a major problem in redistributing liquidity from surplus to deficit institutions. In response to this situation, central banks stepped in as intermediaries (or market makers) of last resort, taking funds from surplus institutions (via excess reserves in the United States and via the use of the deposit facility in the euro area) and lending them to deficit institutions (via the Term Auction Facility in the United States and via the various extensions of the refinancing operations in the euro area).

As a result of these actions, both central banks significantly increased their balance sheets. In particular, the balance sheet of the Federal Reserve System grew from 6.5% of the US GDP at the end of 2006 to 15.8% at the end of 2009, while the balance sheet of the Eurosystem grew from 13.6% of the euro area GDP at the end of 2006 to 21.2% at the end of 2009. The increase in the relative size of the Federal Reserve over these three years was of 9.3 percentage points, whereas that of the Eurosystem was of 7.6 percentage points. Although this corresponds

2 As noted by Ben Bernanke in a speech on 3 April 2009, “Banks were reluctant to rely on discount window credit to address their funding needs. The banks’ concern was that their recourse to the discount window, if it became known, might lead market participants to infer weakness. (...) The perceived stigma of borrowing at the discount window threatened to prevent the Federal Reserve from getting much-needed liquidity into the system.”

to the widespread perception that the Federal Reserve has been a more “active” central bank, the difference in terms of the increase in their balance sheets was not that large (and the relative size of the Federal Reserve at the end of 2009 was still 5.4 percentage points below that of the Eurosystem).

In the next two sections I will provide some specific comments on the two papers, which I will refer to as the ECB paper and the Federal Reserve paper, before going on to conclude in Section 4 with some preliminary thoughts about monetary policy implementation after the crisis.

2 COMMENTS ON THE ECB PAPER

The paper by Cassola, Durré and Holthausen has three main sections. It starts with a description of the three phases of the crisis, then it presents a theoretical model of the interbank market that tries to capture the main trade-offs faced by the ECB, and finally it provides some econometric evidence on the effect of the refinancing operations.

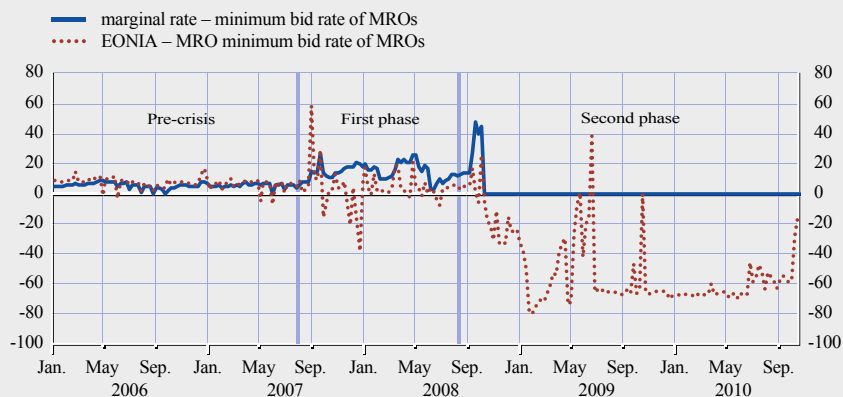
From the perspective of the monetary policy operations of the ECB, the first phase of the crisis, from August 2007 to September 2008, was characterised by the frontloading of liquidity provision and the increase in the amount of longer-term refinancing. The second phase, from September 2008 to October 2009, was characterised by the implementation of non-standard monetary policy measures and the abandonment of the separation principle. The third phase started with the decision to gradually phase out the non-standard measures, which was reversed by the arrival of the European sovereign debt crisis in the spring of 2010.

My first comment on this part of the paper is that the decisions before September 2008, and in particular the frontloading of liquidity provision, represented a straightforward application of the separation principle in light of the change in banks’ bidding behaviour. In fact, this principle was not fully followed, since the ECB allowed the marginal rate of the main refinancing operations to increase above the policy rate (the minimum bid rate) – see the blue line in Chart 1. This was a signal of tighter liquidity provision, and it would be interesting to know why the ECB did it. Was it perhaps to tighten the monetary policy stance through the back door (i.e. without moving the policy rate) in a situation in which inflation in the euro area was heading towards a level significantly above the 2% target?

My second comment is that I do not understand why from September 2008 interbank rates such as EONIA were allowed to fall way below the policy rate – see the red dotted line in Chart 1. If the ECB wanted to lower rates by 50 basis points, why did it not lower the rate of the main refinancing operations by this amount? Why abandon the separation principle and introduce this element of confusion in the stance of monetary policy at this critical stage of the crisis?

Chart | Euro interest rate spreads, 2006-2010

(basis points)



Source: ECB Monthly Bulletin.

The official justification referred to the preservation of the functioning of the interbank markets. In the words of Bini Smaghi (2009), “bringing the main policy rate too close to zero would risk hampering the functioning of the money markets”. And this is what the theoretical model in the paper is supposed to illuminate.

The model has four dates ($t=0, 1, 2, 3$) and a large number of risk-neutral banks that are identical ex ante but are different ex post in that they may suffer idiosyncratic liquidity and solvency shocks at $t=1$ and $t=2$. In addition, the system may experience an aggregate liquidity shock at $t=2$. Apart from the private banks, the model has a central bank that offers a deposit and a lending facility. The main issue analysed in the paper is this: under what conditions would there be an active interbank market in which banks that do not suffer a liquidity shock (surplus banks) lend their excess liquidity to those that do (deficit banks)? The alternative would be that surplus banks place their excess liquidity at the central bank’s deposit facility and deficit banks borrow from the central bank’s lending facility.

To review the analysis in the paper, consider a (type A) bank that has a unit of liquidity surplus at $t=1$ and a unit of liquidity deficit at $t=2$. Let r_t denote the interbank rate at date t , d_t the deposit facility rate at date t , l_t the lending facility rate at date t and q_t the probability that an interbank loan will not be repaid at date $t+1$. At $t=1$ the bank can either use the deposit facility, which yields $1+d_1$ at $t=2$, or lend the unit of liquidity surplus in the market, which yields $1+r_1$ with probability $1-q_1$ or 0 with probability q_1 at $t=2$. On the one hand, if the bank uses the deposit facility, it will have the principal to meet the payment due at $t=2$ and the interest d_1 to invest (say, in the interbank market) which will yield $d_1(1+r_2)$ at $t=3$. On the other hand, if the bank goes to the market and the interbank loan is not repaid, it will have to borrow one unit of liquidity (say, in the interbank market) at $t=2$, and if the loan is repaid it will have the principal

to meet the payment due at $t=2$ and the interest r_1 to invest (say, in the interbank market). Then its net expected payoff at $t=3$ will be $r_1(1+r_2)(1-q_1) - (1+r_2)q_1$. The bank will lend its surplus liquidity in the interbank market at $t=1$ if the net expected payoff of lending exceeds the net payoff from using the deposit facility, that is if

$$r_1(1+r_2)(1-q_1) - (1+r_2)q_1 \geq d_1(1+r_2),$$

which simplifies to

$$1+r_1 \geq \frac{1+d_1}{1-q_1}.$$

Since borrowing (type B) banks will go to the interbank market at $t=1$ if it is cheaper than using the central bank's lending facility, that is if $l_1 \geq r_1$, we conclude that the condition for having an active interbank market at $t=1$ is

$$1+l_1 \geq \frac{1+d_1}{1-q_1},$$

which simplifies to

$$l_1 - d_1 \geq q_1(1+l_1) \approx q_1.$$

In other words, the spread between the central bank's lending and deposit facilities must be large relative to the credit risk in interbank lending.

It should be noted that this condition does not depend on the interbank rate at $t=2$, so contrary to what is stated in the paper *there is no interaction between credit risk and liquidity risk* (the risk that there is an aggregate liquidity shock at $t=2$). This shows that there is a problem with lemma 2 in the paper.

Apart from this, it is important to note that if the condition for having an active interbank market were to be violated, that is if $l_1 - d_1 < q_1$, the central bank would be losing money with its intermediation activity, because it would be charging a spread over the deposit facility rate that would not cover the credit risk of its lending. In other words, we have an active interbank market if the central bank does not provide a subsidy to the borrowing banks. Could this be why the ECB cared about "not hampering the functioning of the money markets"?

However, it should be noted that in models in which banks have either structural liquidity surpluses or structural liquidity deficits, such as the model presented in Bruche and Suarez (2010), central bank intermediation may be an efficient way to deal with money market freezes. In such situations, narrowing the spread between the lending and the deposit facility rates could be desirable.

The conclusion to be drawn from this discussion is that more work needs to be done in order to provide a rationale for abandoning the separation principle in terms of "not hampering the functioning of the money markets".

The ECB paper concludes with an econometric estimation of a VARX model with seven endogenous variables, in which changes in the policy rate are taken to be exogenous. The model is estimated using daily data for the period August 2007 to October 2010. The results show that shocks to the outstanding volume of refinancing operations decrease trading and spreads in the interbank market. Although the results are interesting, there is some concern regarding the empirical strategy, which is based on a model that has too many endogenous variables, some of which have a trend, and which takes as exogenous a variable like changes in the policy rate that is clearly endogenous. The question is: why not estimate a standard structural VAR, with a proper discussion of the identification restrictions?

3 COMMENTS ON THE FEDERAL RESERVE PAPER

The paper by Hilton and McAndrews is divided into two parts: challenges in responding to the crisis and lessons for the future. The three key challenges were how to increase the size of the Federal Reserve's balance sheet in order to tackle the liquidity crisis, how to deal with the stigma of discount window borrowing, and how to arrange collateral requirements for lending to an expanded set of counterparties.

With respect to balance sheet constraints, the obvious thing to note is that liquidity injections increase reserves, so maintaining a policy rate above the zero lower bound requires either mopping up reserves via open market operations or paying positive interest on excess reserves. In fact both avenues were taken by the Federal Reserve, by means of the creation of the Supplementary Financing Program in September 2008 and the provisions in the *Emergency Economic Stabilization Act* of October 2008 respectively.

The problem of the stigma attached to discount window borrowing was inherited from a long tradition of setting the discount rate below the policy rate and adding non-pecuniary penalties (in the form of stigma) to restrict its use. Interestingly, no stigma was attached to borrowing from the ECB, neither in the refinancing operations nor at the lending facility. The way out found by the Federal Reserve was to resort to a liquidity auction system, the Term Auction Facility, in which a potentially large number of banks bid simultaneously on the date of the auction.

In conducting these operations the Federal Reserve had to set up new lending arrangements with banks without Treasury securities to be posted as collateral, as well as with other key institutions such as money market mutual funds. In doing this the Federal Reserve assumed an unprecedented amount of credit risk, which was justified by the need to address unprecedented disruptions in financial markets and institutions.

The three lessons for the future operating framework for monetary policy discussed in the paper by Hilton and McAndrews relate to the payment of interest on reserves, the structure of the Federal Reserve's securities portfolio, and the size of reserve requirements.

The payment of interest on (excess) reserves solves the balance sheet problem noted above, and allows the running of monetary policy with a structural liquidity surplus. It also facilitates acting on the term premium, via quantitative easing (QE), even outside the zero lower bound. However, it naturally reduces the level of trading activity in the federal funds market, which may (or may not) be a source of concern.

In dealing with the crisis, the Federal Reserve acquired a large amount of non-Treasury securities. This will eventually be reversed, since there should be no need to buy or take as collateral such securities in normal times. However, the Federal Reserve should be ready to act in future crises by, among other things, lending for terms longer than overnight, against non-Treasury securities, and possibly on a non-recourse basis – so the authors argue for an expanded credit risk management approach in normal times.

Finally, the third lesson is to note the potential value for the wholesale payment system (Fedwire) of operating with higher reserve balances. This would not only improve the efficiency of payments, but also reduce the risks posed by daylight overdrafts. Achieving this would require much higher reserve requirements, which should be remunerated at market rates to avoid any distortions. It should be noted that for this purpose, and as the case of the ECB illustrates, there is no need to pay interest on excess reserves, only on required reserves.

Summing up, this paper contains a very good summary of the challenges faced by the Federal Reserve during the crisis, but I think that it is somewhat weaker on the lessons for the future. In particular, the paper takes a piecemeal approach focusing on three specific issues, when a more systematic approach would have been desirable. Ideally, this would require a description of the relevant environment, a specification of the central bank's objectives, a list of the possible instruments, and, to conclude, an analysis of the optimal implementation of monetary policy. This should be the subject of an ambitious research project for the next few years.

4 MONETARY POLICY IMPLEMENTATION AFTER THE CRISIS

In broad terms, there are three ways in which monetary policy can be implemented. First, as in the case of the Eurosystem, one may have a *structural liquidity deficit*, and operate monetary policy with a regime under which the central bank lends reserves to the private banks. In this case, the policy rate would be the central bank's lending rate (like the ECB's minimum bid rate in the main refinancing operations). Second, as in the case of the Federal Reserve prior to the crisis, one may have an *approximate liquidity balance*, and operate monetary policy by conducting open market operations designed to compensate the daily movements in the autonomous liquidity creation factors. In this case, the policy rate would be the target short-term money market (Federal funds) rate. Finally, as perhaps in the case of the Federal Reserve after the crisis, one may have a *structural liquidity surplus*, and operate monetary policy with a regime under which the private banks lend reserves to the central bank. In this case, the policy rate would be the interest rate paid by the central bank on excess reserves.

Since it is unclear which system is best, studying this issue should be a high priority for all central banks. I would like to conclude with some preliminary thoughts on these alternatives.

First, having a structural liquidity deficit is good for distributing liquidity broadly, since there is no stigma attached to borrowing from the central bank (everybody does it). However, if the deficit is too large, the central bank has to be willing to take non-government paper as collateral. Thus, a large structural liquidity deficit requires some careful management of credit risk, which in principle is not the comparative advantage of the central bank. Also, a system with a structural liquidity deficit will penalise banks under the future Basel III regime,³ since the Liquidity Coverage Ratio will require them to hold additional liquid assets to back their short-term borrowing from the central bank.

Second, having a structural liquidity surplus is bad for distributing liquidity broadly, since the stigma of having to borrow from the central bank may remain. It also requires that there is a large pool of suitable assets that the central bank can hold (something that should not be a problem in the foreseeable future). However, if the central bank were forced to hold longer-term government securities (or private securities) in its portfolio, it could incur losses that might endanger its independence.⁴ Insofar as this is would be anticipated, it could imply an undesirable constraint on monetary policy decisions.

3 See Basel Committee on Banking Supervision (2010).

4 In particular, the situation of the central bank could resemble that of the US Savings and Loans institutions in the 1980s, with a combination of low-return, long-term assets and high-cost, short-term liabilities. The difference, of course, is that the central bank could control the cost of its liabilities via the setting of the policy rate.

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