Response of the Financial Markets to the European Central Bank's Policy Announcements during the Subprime and Global Financial Crisis

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Abstract

This paper surveys evidence of the impact of macroeconomic and financial sector policy announcements in the euro area during the recent crisis on interbank credit and liquidity risk premia. Evidence suggests that interest rates cuts, fiscal stimulus and recapitalization measures were effective in calming the distressed financial markets as measured by reduction of the Libor–OIS spread. However, decisions not to reduce interest rates as well as ad hoc bank bailouts widened the Libor–OIS spread thus increased stress in the financial markets. Liquidity support announcements were initially effective, as measured by the reduction in the Libor-OIS spread, but lost significance as the crisis worsened. Both announcements of capital injections and guarantees on bank liabilities were effective in reducing credit risk in the euro area. The results of the event study further illustrate that the short-term impact of interventions depended on the particular circumstances that prevailed during each phase of the crisis.

JEL Classification: E63, E65, G01, G14, G15, G18

Key words: Financial Markets, European Central Bank, Policy Announcements, Subprime Crisis

1 Introduction

The ability to enhance the predictability of monetary policy is hailed as one of the fundamental benefits of increased central banks policy announcements in recent years. To this end, many central banks, including the European Central Bank, Swiss National Bank,

the Bank of England and the Federal Reserve announce their monetary policy decisions on regular basis. Through post-meeting press conferences, and press releases, speeches, expanded testimony before the legislature, release of the minutes of policy meetings, and the regular publication of reports on monetary policy and the economy, many central banks are said to have succeeded in signaling their future policy intentions to the public in a more explicit way (Bernanke, 2004; Weber, 2008; Ehrmann and Fratzcher, 2005; Poole 2005.

Yet despite the plethora of studies that relate movement of asset prices and changes in interbank risk premia with macroeconomic and financial sector policy announcements, the impact induced by specific types of policy announcements did not generate much interest, until the recent crisis. How for instance, did anyone expect the market to respond to announcements of interest rate cuts by ECB or recapitalization measures by U.S during the global crisis? Experiences with unprecedented market interventions announced and undertaken by the authorities of major advanced economies during the financial crisis will continue to offer valuable lessons in the conduct of monetary policy.

This essay reviews evidence on the response of the financial markets to the specific policy measures that were announced by the European Central Bank during the subprime and global financial crisis. Whenever possible, such responses in the euro area are compared with those (for similar events) in the United States and the United Kingdom. While most evidence from recent studies has focused on the US, a number of contributions also provide evidence for the euro area, e.g. IMF (2009) and Ait-Sahalia et al (2010) provide interesting analysis of the impact of macroeconomic and financial sector policy announcements by authorities of major advanced economies (including the euro area) on interbank credit and liquidity premia. They helpfully distinguish the effects of the announcement by policy category, namely, interest rate decisions; quantitative and credit

easing as well as liquidity support; recapitalization; fiscal stimulus packages or asset purchases, liquidity guarantees; deposit insurance; and bail outs of individual banks.

Their analysis also distinguishes between two phases of the crisis: the subprime crisis, which began on June 1, 2007 to the collapse of the Lehman Brothers on September 14, 2008, and the global crisis that began from September 15, 2008 to March 31, 2009. This makes it possible to discern the effectiveness of policy initiatives in the two scenarios. Against heightened uncertainty about financial and macroeconomic prospects, the United States, United Kingdom and euro area among other advanced economies initiated a wide-ranging policy measures during the subprime crisis, announcing interest rate cuts, and continue to announce major policy measures during the global financial crisis – as the need to restore financial stability and avoid global economic depression became urgent. In the United States, the recapitalization measures, fiscal stimulus and bail outs, fiscal easing and liability guarantee were frequently announced.

The United Kingdom, on her part, announced initiative to provide liquidity support, forex swaps and liquidity guarantees. During the global financial crisis, the UK continued to announce its interest rate cuts as well as liquidity support, financial restructuring measures (recapitalization), bail out (asset purchases), liquidity guarantees and quantitative easing. In euro area, the European Central Bank announced interest rate cuts and decisions to keep interest rate stable at other times. ECB further announced measures to provide fiscal easing, bank bail outs, recapitalization and liquidity guarantee targeted at selected central banks. Figure 1 shows the accumulative set of interventions that were announced for a sample of major advanced economies.

The effects of policy announcements are measured in many ways. Both the IMF (2009) and Ait-Sahalia et al (2010)'s studies measure the effects on policy announcements

on the day-to-day changes in the 3-month U.S. dollar Libor–OIS spread[1] — a proxy for the liquidity and counterparty risk premia in the global interbank markets. The Libor–OIS spread is widely accepted as an indicator of financial distress (Taylor, 2009) and a valuable measure of the effectiveness of policy interventions (McCormick, 2007). A positive Libor–OIS spread indicates that the market is under stress. Discussions in section four are primarily based on effects of policy announcements on the Libor–OIS spreads.

The rest of the essay is organized as follows. Section two provides a brief overview of the theoretical arguments underpinning announcements and expectation formation, how policy signals can influence behavour of market agents. Section three highlights the methodological approaches used in recent announcement studies while section four discusses the empirical evidence and section five concludes.

2 An overview of theoretical literature on announcement effects

Based on standard theories of market expectation formation, effects of central bank signals on *expectations* of future monetary policy decisions (e.g. interest rate) are defined by:

$$r^e_{t+1} = H_1(y_t, R_t, r_t, ..., s_t) + u_t$$

or

$$r^e_{t+j} = H_j(y_t, R_t, r_t, ..., s_t) + u_t \qquad (1)$$

where r_t is current overnight rate and r^e_{t+1} is today's expectation of tomorrow's overnight rate, while s_t is a vector of central bank signals, e.g., announcing a numerical inflation

[1] The spread between the London Inter–Bank Offered Rates (Libor) and Overnight Index Swaps (OIS) for the U.S. dollar. The Libor serves as the main instrument for benchmarking short-term rates and is used as the basis for settlement of interest rate contracts on many of the world's major futures and option exchanges (see www.bbalibor.com for details). The OIS rate is a measure of the expected risk-free interest rate over specific terms of secured transactions.

target.[2] Intuitively, central bank announcement (s_t) influence expectations of future short-term rates (r^e_{t+j}), which, in turn, influence long-term rates and other financial-market prices (Rt). These prices, in turn, influence such macro variables as inflation and output (π_t and y_t).

As noted by Woodford (2001: pp. 307 and 312), successful monetary policy is not so much a matter of effective control of overnight interest rates as of affecting the evolution of market expectations. The focus of the central bank should be to increase the predictability of the market by raising the signal-to-noise ratio (by eliminating any guessing on the part of the public) to enable market participants to make more efficient decision (William Poole (2001: p.9) and Alan Blinder (1998: pp. 70-72)). The cases reviewed by Blinder et al (2010) show compelling evidence that the predictability of the interest rate decisions of the major central banks has improved remarkably in recent years— suggesting that financial markets' expectations have become generally well aligned with actual decisions.

Although the ECB was not given a quantitative objective by the Maastricht Treaty, it provided one for itself as an important part of its monetary policy strategy (Blinder et al 2010) and is able to affect the evolution of market expectations. The ECB follows a price stability strategy (unlike other central banks e.g. bank of England that follow inflation targeting — IT strategy). Nonetheless, ECB releases (some aspects of) its inflation forecasts through the staff projections, published four times a year, supplemented by the ECB's *Monthly Bulletin,* which is published one week after each monetary policy meeting.

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[2] Agents' expectation formation in (1) is facilitated by knowing the targets y^*_t and π^*_t in the central bank's policy rule: $r_t = G(y_t - y^*_t, \pi_t, \pi^*_t, \ldots) + v_t$

where π_t is inflation and $y_t — y^*_t$ denote the output gap, and π*, the central bank's inflation target.

The Bulletin provides an assessment of economic developments, including information on models, methods and indicators used. Besides, the ECB releases a press statement with the policy decision, but also holds a press conference on the day of Governing Council meetings, and responds to questions. For likely future policy decisions, ECB uses indirect signals: in the form of code words like "vigilance" (David-Jan Jansen and De Haan, 2007).

3 Event Study Methodology

Both the IMF (2009) and Ait-Sahalia et al (2010) have used event study methodology to analyze the response of the markets to policy initiatives announced by selected advanced economies. Event study methodology is well established, especially in the finance literature (e.g., Campbell, Lo, and McKinlay (1997). For the euro area, Ait-Sahalia et al (2010) include policy announcements by the European Central Bank (ECB) and national authorities from Austria, Belgium, France, Germany, Ireland, Italy, the Netherlands, and Spain. The dates of policy announcements are based on official press releases, major newspapers and news search engines. The data are double–checked against similar compilations of crisis events by central banks, investment banks, international organizations and individual researchers (for example, Federal Reserve Bank of St. Louis (2009); Furceri and Mourougane (2009); Global Financial Association (2009); Guillén (2009).[3] In all the studies, necessary care seems to have been taken in ensuring robustness of the results, including selection of event windows, timing of announcements, extracting the intention or objective behind a policy statement, etc.

[3] Given a great diversity of the economic and financial press in the euro area, the authors identified watershed events using additional news sources such as Bloomberg and Associated Press, and the coverage in Federal Reserve Bank of New York (2009).

The ECB announces its decisions at 1:45 pm, without any explanatory statements, and then explains the decisions in detail in the press conference 45 minutes later. Because of that delay, the market reaction to the release of the decision can be distinguished from the market reaction to the forward-looking announcements by using very high-frequency data. This way, you obtain results that are similar to those obtained with the principal components approach of Gürkaynak *et al*. (2005). Finally, it appears to me, the results are robust to controlling for the surprise content of announcements and using alternative measures of financial distress. However, what is reassuring about the findings of these studies (discussed in section 4) is their consistence (they reinforce each other).

4 Discussion of empirical results

4.1 Overview

For countries where market responses to policy announcements during the recent financial crisis are analyzed, responses of the markets to specific crisis-related policy initiatives tend to be similar across countries (at least as far as direction of the response is concerned) though significant cross-country diversity do exist in the extent to which each market reacts to the same events, measured by Libor-OIS spreads. Across countries, effects of policy announcements were greater during the global crisis than the subprime crisis and were most significant in the United States compared with the euro area, United Kingdom, Japan or any other developed economies.

Evidence emerging from these assessments generally distinguishes between two categories of announcements: those that were effective in calming the distressed financial markets and those that increased stress in the financial markets. Interest rates cuts fall in the first category together with fiscal stimulus and recapitalization measures. In the second

category, includes announcements of decisions not to reduce interest rates and about ad hoc bank bailouts.

4.2 Interest rate cuts

Aït-Sahalia et al (2010) and IMF (2009) find that announcement of interest rates cuts decreased stress in the financial market during the financial crisis, evident by decline of the Libor–OIS spread in all the countries that were studied, including euro area. Announcements of interest rate cuts were found to be more effective in calming the distressed financial markets than announcements about liquidity support especially when the crisis worsened. In the euro area, interest rates were cut much more gradually during the subprime crisis and even during global crisis most likely over concerns about price stability and the functioning of the money market. In the midst of this, the euro area was found to have benefited from aggressive interest rate cuts by the United States during the subprime crisis and the United Kingdom during the global crisis – associated with decline in Libor-OIS spreads.

4.3 Liquidity support

Announcement of domestic currency liquidity support in the euro area during the global crisis were followed by significant reductions in interbank credit and liquidity risk, but to a less extent compared to interest rate cuts. In theory, if liquidity support is interpreted to signal underlying solvency problem, the impact can be negative. Evidence, however, confirm that the liquidity support that was announcement by central banks helped to reduce funding pressures particularly for institutions that depended on liquidity facilities. By this, it contributed to lowering of liquidity risk premia in the interbank markets.

Across countries, however, the IMF (2009) findings show the importance of liquidity support in the first period of the crisis; as the crisis worsened, the announcement of liquidity support measures no longer had a direct impact on interest rate spreads. This does not necessarily mean that liquidity measures were less effective, but rather that they might have been anticipated.

4.4 Liability guarantees and recapitalization measures

As expected, announcements of government guarantee scheme had larger impact on interbank risk premia than asset purchases had due to the ability of the scheme to transfer risks from banks' balance sheets to the sovereign. Similarly, announcements of initiative to recapitalize the banks also yielded a favourable response in the interbank markets, with a substantial 20 basis point average reduction in the Libor–OIS spread over the event window during the global crisis (Aït-Sahalia et al 2010).

When announcements to recapitalize the banks and to provide liability guarantees in the euro area were carefully considered, results show wider spreads (similar to the U.K) but were not statistically significant. This is probably is due to a limited integration of the crisis response, (as results demonstrate) with most recapitalization and liability guarantee measures targeted at selected national banks. Earlier, IMF (2009) had also found that announcements of liability guarantees reduced credit risk significantly in some cases (euro area and the United Kingdom), but not in the United States — which it attributes to the same fact that liability guarantees secure only a subset of creditors and not the bank as a whole. Table 2 shows that announcements of asset purchases or guarantees led to a statistically significant reduction in a country's average bank CDS (composite index of the credit default swap) spread in three cases, the euro area, Switzerland, and the U.K.

It is important to note, however, that fiscal policy measures were not targeting reduction in interbank risk premia although they helped to reduce the Libor-OIS spreads, perhaps because the markets interpreted the initiative as evidence of political will to support ailing financial institutions. In fact, Aït-Sahalia et al (2010) provide evidence that announcements of fiscal stimulus packages by the euro area during the global financial crisis helped reduce the Libor-OIS spreads. Available studies indicate that the euro area governments announced fiscal stimulus measures later than other major economies like the United States and the United Kingdom. The reason is that they expected automatic stabilizer to play a more significant role during the crisis. But they also faced challenge of coordination and constraint imposed by the EU's stability and Growth Pact.

4.5 Decisions not to reduce interest rates

Announcements by central banks to maintain or increase policy rates, on the other hand, attracted negative reaction of the markets – with average increase of about 25 basis points in the Libor–OIS spread over the event window. So were announcements of liability guarantee, and asset purchases which were followed by wider spreads between the Libor and OIS rates during the global crisis. This revelation is much similar to that of bank bailouts (that I shall turn to shortly), and is very much linked to problem of insufficient coordination. However, none of the policy announcements that were made attracted worse response from the markets than the ad hoc bank bailouts and bank failures, with the Libor–OIS spreads widening by nearly 50 basis points on average over the event window.

4.6 Bank bailouts and fiscal stimulus

According to Aït-Sahalia et al (2010), although announcement of bank bailouts within the euro area were associated with rise in interbank credit and liquidity risk premia

— i.e. higher Libor – OIS spreads, the situation was less severe than it was in the United States. They also found that although announcements of fiscal stimulus during the subprime phase of the crisis did not result in significant reductions in the Libor-OIS spread for the euro, announcements of fiscal stimulus in the U.S. and announcements of liability guarantees and recapitalization in the United Kingdom during subprime crisis had significant impact in the euro area (Table 3, Appendix).

However, domestic announcements of fiscal easing were associated with reductions in interbank credit and liquidity risk premia during the global phase of the crisis (Ait-Sahalia et al 2010). There are suggestions that announcements concerning recapitalization were relatively ineffective in reducing the risk premia in interbank markets during the subprime crisis because they were meant to address shortfalls at the individual institutions. This changed during the global crisis when such announcements led to remarkable reductions in the Libor-OIS spreads in the United States and Japan. The impact of the recapitalization measures were less significant in the euro area, just like in the United Kingdom, among other countries perhaps owing to greater concerns about the rigor of stress tests used to determine banks' capital needs in these economies as highlighted by Sahalia et al 2010). The euro area benefited from announcements of recapitalizations by the U.S. However, announcements of asset purchases were not helpful in reducing credit and liquidity risk premia, both in domestic and foreign markets.

4.7 Spillover effects

The spillovers from foreign announcements carry an important policy lesson. That, financial markets have become so much integrated that policy initiatives in response of a crisis taken by major economies are likely to have a bearing on market conditions in other

countries. Again, knowing that a decision of inaction (to raise or not to reduce interest rate) and announcements of ad hoc bailouts during a crisis of this nature can affect financial risks in other countries is itself very valuable for policy decision.

Studies document intensification of international spillovers during the global phase of the financial crisis. During the subprime crisis, foreign policy initiatives hardly had any effects beyond national borders, but when decisions to bailout certain banks (especially in the U.S) and to maintain the policy rates were announced, it sent shock waves around the globe. Obviously, the interdependence of major systemic economies means that effects of monetary inaction and ad hoc or unsystematic rescue packages can go beyond national borders.

5 Conclusions

This essay reviews evidence on the impact of policy announcements on the financial markets in the euro area drawing on studies in this field. Based on the evidence, the following conclusions can be made. Similarity in responses of the market to specific crisis-related policy initiatives. During a financial crisis of the nature experienced recently, measures to cut down interest rates and provide fiscal stimulus as well as recapitalization measures seem to be are appropriate options that are likely to calm the distressed financial markets as they were able reduce risk premia in the interbank markets in all the cases. Ad hoc bank bailouts as well as measures to increase or maintain interest rates constant are likely worsen the crisis as they happened to increase interbank risk premia in all the cases. Fiscal stimulus, if properly introduced, are likely to restore confidence in the financial system during a crisis and can alleviate the crisis.

Finally, policy initiatives announced in one country has a significant bearing in another country (as demonstrated by their effects on credit and liquidity risk premia) with the effect increasing as the crisis intensified. This spillovers of policy announcements underscore the need for a coordinated policy response to restore market confidence during a global crisis. The results of the event study further illustrate that the short-term impact of interventions depended on the particular circumstances that prevailed during each phase of the crisis.

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Appendix

Table 1. Table Classification of Events

Central Bank—Monetary Policy and Liquidity Support	
Interest rate change	Reduction of interest rates
Liquidity support	Reserve requirements, longer funding terms, more auctions and/or higher credit lines
	Domestic system lender of last resort: broader set of eligible institutions, wider collateral rules, and/or eligible collateral
	Other liquidity support (e.g., support of money market funds)
	Foreign exchange lender of last resort: forex swap lines (with other central banks) and forex repos
Government—Financial Sector Stabilization Measures	
Recapitalization	Capital injection (common stock/preferred equity)
	Capital injection (subordinated debt)
Liability guarantees[1]	Enhancement of depositor protection
	Debt guarantee (all liabilities)
	Debt guarantee (new liabilities)
	Government lending to an individual institution
Asset purchases[2]	Asset purchases (individual assets, bank by bank)
	Asset purchases (individual "bad bank")
	Provisions of liquidity in context of bad asset purchases/removal
	On-balance-sheet "ring-fencing" with toxic assets kept in the bank
	Off-balance-sheet "ring-fencing" with toxic assets moved to a "bad bank"
	Asset guarantees

Source: IMF staff estimates, reproduced from IMF (2009).

[1]Includes the Federal Reserve's liquidity support to AIG for toxic asset removal to a special-purpose vehicle, coupled with government's loss sharing.

[2]Includes business loan guarantees as part of financial sector stabilization measures (e.g., the United Kingdom, Germany); for some countries, asset purchases were not conducted by the government, but (also) by the central bank (or a central bank-sponsored) agent, such as in the case of the United States and Switzerland.

Table 2. Effectiveness of Crisis Interventions

	Monetary Policy		Financial Sector Policy		
	Interest rate cuts	Liquidity support	Recapitalization	Liability guarantees	Asset purchases
	Economic stress Index	LIBOR-OIS spread	Bank credit default swap spread		
	Event window (–1/+3 days)				
	Period 1: Pre-Lehman (06/01/07 to 09/14/08)				
Euro area	–	x	x	x	x
Japan	–	–	–	–	–
Sweden	–	x	x	x	–
Switzerland	–	x	–	–	–
United Kingdom	x	x	–	x	–
United States	x	x	–	x	x
	Period 2: Global Crisis 1 (09/15/08 to 12/31/08)				
Euro area	x	x	x	x	x
Japan	x	x	x	–	–
Sweden	–	x	–	x	–
Switzerland	x	x	x	x	x
United Kingdom	x	x	x	–	–
United States	x	x	x	x	x
	Period 3: Global Crisis 2 (01/01/09 to 06/30/09)				
Euro area	x	x	x	x	x
Japan	–	x	x	–	–
Sweden	–	x	–	–	–
Switzerland	x	x	–	–	x
United Kingdom	x	–	x	–	x
United States	x	x	x	x	x

Source: IMF staff estimates; reproduced from IMF (2009).

Note: Shading denotes a statistically significant intervention at the 10 percent level. The statistical significance of the short-term impact of intervention announcements is tested as follows: (1) interest rate cuts on the economic stress index; (2) liquidity support on the three-month LIBOR-overnight index swap (OIS) spread; and (3-5) financial sector interventions on credit default swap spreads of local banks, weighted by the size of total assets. Only the front page policy announcements were considered. An unshaded "x" denotes statistically insignificant interventions and a "–" implies there were fewer than two front page policy events during the given subperiod. Statistical significance is attributed to policy measures only if both the parametric and the nonparametric tests concur.

Table 3. Effect of Foreign Policy Announcements on Libor–OIS Spreads

	Subprime crisis				Global crisis			
	U.S.A	**U.K**	**Euro area**	**Japan**	**U.S.A**	**U.K**	**Euro area**	**Japan**
Fiscal Policy	—	US	US,UK	US	JP	EU	JP	US
Interest rate cuts	0	0	0	0	UK,JP	EU,JP	JP	EU,UK
Quan./credit easing	0	—	0	0	0	0	UK,JP	UK
Domestic currency*	0	0	0	0	0			0
Forex swap lines*	EU	0	0	0	—	—	—	—
Recapitalisation	0	0	UK	0	EU	US,JP	US,UK	US
Asset purchases	—	0	0	0	0	EU	0	EU
Liquidity guaratees	UK	US	UK	US	0	US	US	0
Policy inaction and bank bailouts	0	JP	US,UK	US	*EU*	*US*	*UK*	*US*

Source: Aït-Sahalia, Andritzky, Jobst, Nowak, Tamirisa (2010)
Notes: * = Liquidity support. Table show statistically significant spillover effects of domestic policies on the corresponding country, based on bilateral country analyses — with column header country being the recipient of spillover originating from those in the cells. *Italics* mean increase in the Libor-OIS spreads due to spillovers and regular font a decrease; shaded indicate significant spillovers from all foreign announcements; dashed-line borders indicates increase in Libor-OIS spreads. "0" statistically insignificant spillovers; — means spillovers not feasible (foreign announcements did not occur or did not qualify as a front-page event).