



The interbank market after the financial turmoil: Squeezing liquidity in a “lemons market” or asking liquidity “on tap”

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ABSTRACT

After August 2007 the plumbing system that supplied banks with wholesale funding, the interbank market, failed because toxic assets obstructed the pipes. Banks were forced to squeeze liquidity in a “lemons market” or to ask for liquidity “on tap” from central banks. This paper disentangles the two components of the 3-month Euribor–Eonia swap spread, credit and liquidity risk and then evaluates the decomposition. The main finding is that credit risk increased before the key events of the crisis, while liquidity risk was mainly responsible for the subsequent increases in the Euribor spread and then reacted to the systemic responses of the central banks, especially in October 2008. Moreover, the level of the spread between May 2009 and February 2010 was influenced mainly by credit risk, suggesting that European banks were still in a “lemons market” and relied on liquidity “on tap” even before sovereign debt crisis unfolded in Europe.

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1. Introduction

The main purpose of the paper is to analyse developments in the euro interbank market after the financial market crisis beginning in August 2007. The turmoil heavily affected the interbank market, an important source of short-term liquidity for the banking system. A simple picture can render the effects of the crisis, showing the fundamental importance of this plumbing system: the appearance of toxic assets obstructed the pipes because it was impossible to be sure whether the counterparty was a “lemon” or not. Banks were forced to squeeze liquidity in a “lemons market” or to turn to the only source that could provide it “on tap”, the central banks.¹

A widely used measure of the dysfunctions on the interbank market is the spread between unsecured and secured rates, which jumped to historically high levels after August 2007. Before the crisis, the main component was the counterparty risk of the borrower of an unsecured loan. After the turmoil, credit risk augmented because of uncertainty about the financial situation of counterparties

due to poor disclosure about losses on structured products; moreover, increased risk aversion contributed to a re-pricing of credit risk. Since August 2007 another determinant of the spread has become important: liquidity risk for the banks increased because market liquidity diminished or even disappeared as a result of asset fire sales and the difficulty or impossibility of calculating some asset prices.

The disruptions on the interbank market have a considerable effect on the whole economy because the price determined in this market affects borrowing conditions for firms and households and could interfere in the normal transmission of monetary policy. Indeed, between August 2007 and May 2009 the spread between unsecured and secured lending for euro, dollar and sterling was over 50 basis points and well above 100 basis points during the 6 months after Lehman’s collapse. Compared with a spread that was as low as 10 basis points before the crisis, the problems on the interbank markets implied a higher cost of financing, which has been cushioned by record-low policy interest rates.²

The financial crisis renewed interest on the theory of interbank markets, which is related to moral hazard and asymmetric

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¹ It is important to underscore that central banks can affect interest rates and liquidity independently: injections of liquidity do not necessarily imply a reduction in the policy interest rates and vice versa (e. g. Borio and Disyatat, 2009).

² Before the collapse of Lehman Brothers, 3-month sterling Libor was around 6%, 3-month Euribor around 5%, and 3-month dollar Libor around 3% (it was around 5% before the crisis: the FED had already cut interest rates in 2007); all decreased to less than 1% in the following months.

information literature (Diamond and Dybvig, 1983). Among others, Heider et al. (2009) develop a model which includes counterparty risk in presence of asymmetric information and showed that banks prefer to hoard liquidity in presence of high dispersion of risk so that adverse selection destroys participation to the market. A related strand of literature, following Allen and Gale (2000) and Diamond and Rajan (2005) analyse the effect of liquidity shocks on interbank market (Brunnermeier and Pedersen, 2009) also including the role played by central banks (Allen et al., 2009).

Within the broad background summarized above, the paper has two empirical aims. The first is to disentangle the credit and the liquidity component in the euro interbank market; the results of the decomposition are relevant because central banks can affect only the latter, while credit risk depends on the characteristics of the participants in the market. The second aim is to test the accuracy of this decomposition by linking the two risks to actual financial variables. This assessment is a contribution to the existing literature and is paramount because the two components are obtained through subsequent approximations.

The first objective of the paper is to analyse the 3-month Euribor–Eonia swap spread (a measure of the unsecured–secured spread; also called Euribor spread in the paper), which I disentangle into two main components. The first relates to the credit risk of the banks in the Euribor panel, used as a proxy of counterparty risk in the interbank market; the second relates to liquidity risk, which represents the cost charged by a lender to insure against a liquidity shock during the period in which the loan is outstanding. I derive the credit risk component from CDSs of the banks included in the Euribor panel, while I obtain the liquidity risk as the difference between the Euribor spread and the credit risk. The approach is similar to Bank of England (2007), which proposed this decomposition for Libor spread. Following works focused on Libor spread are Michaud and Uppel (2008), and Taylor and Williams (2009), while ECB (2008a), Eisenschmidt and Tapking (2009), Angelini et al. (2009), and Nobili (2010) analysed the euro interbank market. After the decomposition, I describe the link between the intervention of central banks and the dynamics of liquidity risk. In a way this analysis is related to those proposed by Brunetti et al. (2009), and Christensen et al. (2009) about the effect of central bank liquidity facilities.

An important development with respect to previous literature is the time span under study, which ends in February 2010 and allows me to consider an apparently quieter period. The particular behaviour of the euro interbank market during these months is the reason for the paper's interest in this period. In fact, before the crisis, and even during the most critical moments of the turmoil, the spread for euro interbank loans was lower than the spread for sterling or dollar loans. However, the situation changed between May and July 2009. On the one hand, the spread for sterling and dollar loans continued to decrease, reaching levels similar to those prevailing before the turmoil. On the other hand, the euro spread remained stable at a level around fivefold that prevailing before the crisis and higher than the spread on the other two currencies. A possible explanation for this feature relates to the deeper problems still affecting European banks, which may be reflected in a higher counterparty risk on the euro interbank market.³ The decomposition of the Euribor spread offers an important indication in this sense because it allows me to identify its prevailing component and gives a different picture for the second half of 2009.

The two research questions based on these dynamics are (1) why did the Euribor spread increase after August 2007 and (2)

why did it not return to the pre-crisis level in the second half of 2009?

The results of the decomposition suggest that credit risk increased before the most important events of the crisis but that liquidity risk was mainly responsible for the subsequent increases in the Euribor spread and then reacted to the systemic responses of the central banks, especially in October 2008. Moreover, the level of the spread between May 2009 and February 2010 was influenced mainly by credit risk, suggesting that European banks were still in a “lemons market” and relied on liquidity “on tap”. These results are robust to different methods. In particular, a stochastic decomposition yields similar results to the deterministic one.

The second objective of the paper is to assess the decomposition by means of an innovative procedure that builds on two considerations. First, the decomposition of the Euribor spread relies on the credit risk measure being representative, which implies it should be as unrelated as possible to liquidity risk, especially during the crisis. Second, market liquidity should influence only the liquidity component of the spread, while risk aversion should be linked essentially to credit risk. The idea behind these two relations is that there exists a positive link between the credit risk of the counterparty in an unsecured transaction and the risk aversion of the lender, the effect of which is to increase this cost component of the loan. Liquidity risk depends instead on the possibility that an eventual liquidity shock cannot be solved on the interbank market and is related to market conditions.⁴

The empirical analysis moves from these two considerations. First, I focus on the correlation between the Euribor spread, its liquidity and credit component, and measures of risk aversion or market liquidity. They include proxies used in the previous literature and others based on European variables, since I focus on the euro interbank market. As a further robustness check, I evaluate the correlations using univariate time series analysis. The aim of the regressions is not to establish causal relationships, but only to verify the strength of the relations. The regressions are estimated also using GARCH models, owing to the presence of periods of different volatility in the time span under analysis. The use of this model is another improvement on some previous time series analyses. Finally, I derive two other measures of liquidity risk, which are used to assess the one derived as a residual from a deterministic decomposition.

The analyses show that there are only relationships between credit risk and measures of risk aversion, and between liquidity risk and proxies of market liquidity. Liquidity risk is related both to European and US market liquidity, while after the crisis credit risk becomes correlated with measures of risk aversion, both general and specific to Europe. These results somehow change after May 2009, when the influence of US variables on the Euribor spread or liquidity risk is non-significant, even if credit risk still has a relation with general measures of risk aversion.

The paper is organized as follows. The second section presents the dynamics of the rates on the interbank markets and of the variables used in the empirical analysis. The first objective of the paper (the Euribor spread decomposition) is dealt with in the third section. The fourth section evaluates the decomposition and the fifth section deals with some additional analyses to test the results. The main findings obtained from the decomposition, as well as those related to its assessment, are summarized in the sixth section, which also contains some concluding remarks.

³ IMF (2010) underscores the greater problems of the euro area due to sovereign risk. Further sources of concern are the financial sector's expected write-downs in 2010 and slow economic growth.

⁴ In principle, there is also a relation between risk aversion and market liquidity because a lender can be so risk averse as to decide to exit from the interbank market, thus affecting market liquidity. However, the effects of the single participant should be marginal.

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