



The role of bank relationships in the interbank market



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ABSTRACT

This paper empirically explores the effect of bank lending relationships in the interbank market. We use data from the e-MID market that represents the only transparent electronic platform in Europe and USA, unaffected by search costs and other fictions. We show that stable relationships exist and that they played a significant role during the 2007–2008 financial crisis. Trading with preferred counterparts is associated with more favorable rates for both lenders and borrowers, and carries larger trading volumes. The results point to a peer monitoring role of relationship lending, which contributes, at a time of financial distress, to a smooth liquidity redistribution among banks. Relationship lending thus plays an important positive role for financial stability.

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1. Introduction

Financial markets have been under extreme pressure since the start of the financial crisis late in 2007. Many components of the global economy and financial structure, from bond and share prices to money markets and foreign exchanges, were affected by the market conditions following the turmoil. Among the areas affected, the money market stands out as a crucial element as it supports the implementation of monetary policy and stable borrowing conditions for the financial sector, other corporations and individuals. Within the interbank market, which covers maturities from one day to one year, the overnight (O/N) segment is of particular interest because the O/N interest rates are directly affected by rules and practices governing the refinancing operations run by the European Central Bank (ECB). This is the segment of the money market where credit institutions look to mitigate any risk that may emerge from short-term liquidity shocks and to ensure that the trading day is closed with healthy liquidity positions. The interbank market is a significant element due to the fact that the O/N rates are determined in this market. Furthermore, interbank markets are central hubs for complex institutional networks, connecting all financial organizations in the banking industry (Iori et al., 2008; Fricke and Lux, 2015a, b).

During the crisis, increased uncertainty about counterparty credit risk led banks to hoard liquidity rather than making it available in the interbank market. Money markets in most developed countries almost came to a freeze and banks were forced to borrow from Central Banks. Nonetheless there is growing empirical evidence that banks that had established long term interbank relationships had better access to liquidity, both before and during the crisis (Furfine, 2001; Cocco et al., 2009; Affinito, 2012; Liedorp et al., 2010; Brauning and Fecht, 2012). Overall these studies have shown that banks build

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stable relationships over time and benefit from more favorable rates when trading with their preferred counterparties. This evidence suggests that, particularly at a time of deteriorating trust towards credit rating agencies, private information acquired through repeated transactions plays an important role in mitigating asymmetric information about a borrower's creditworthiness and can ease liquidity redistribution among banks. The markets analyzed in the above studies have a distinct over-the-counter (OTC) structure (Furfine, 1999, looked at the U.S. interbank market, Cocco et al., 2009, at the Portuguese, Affinito, 2012, at the Italian, Liedorp et al., 2010, at the Dutch, and Brauning and Fecht, 2012, at the German ones). Traders in OTC markets actively search for counterparties. When counterparties meet, they negotiate terms privately, often ignoring prices available from other potential counterparties and with limited knowledge about trades recently negotiated elsewhere in the market. As suggested by Duffie et al. (2005) banks may form relationships in OTC markets to avoid costly counterparty search under asymmetric information about the liquidity shocks of other banks. Brauning and Fecht (2012) for example report that in the run-up to the 2007–2008 financial crisis relationship lenders charged higher interest rates to their borrowers. The liquidity insurance premium paid for the relationship supports, at this time, the argument of Duffie et al. (2005).

The main goal of our paper is to explore the existence of stable trading relationships, before, during and after the 2007–2008 financial crisis, in an electronic and transparent venue such as the e-MID. The e-MID stands out as the only fully transparent trading system in Europe and the USA, with 'buy' and 'sell' proposals available on screens of the trading platform, along with the identity of the banks quoting them. Information on the terms (prices and amounts) of executed trades are available to banks in real time. Search frictions, thus, should not affect the matching process in the e-MID market. Furthermore lack of information on rates offered by alternative lenders cannot be responsible for the observed cross sectional dispersion of O/N rates in this market. In a perfectly transparent market there is little scope for relationship lending, unless private information, acquired through repeated transactions, is valuable in mitigating asymmetric information about a counterparty creditworthiness. Our objective is thus to disentangle search frictions from information effects as the determinant of relationship lending in the interbank market.

For our analysis we represent the market as a network consisting of nodes (banks) and a time-varying number of, weighted and directed, links between them (representing interbank loans). The direction of the links follow the flow of money (from lenders to borrowers) and the weights are given by the number of loans exchanged by each pair, over a given period of time. Two banks can be connected by two links, one in each direction, if they both act as lenders and borrowers. As a proxy of strength for a pair relationship we use, as detailed in Section 4, a measure of concentration of lending and borrowing activity. Our main two relationship variables, defined as LPI and BPI for lending and borrowing preference indexes, respectively, are constructed within this network framework. We evaluate if changes in these relationship measures within a given bank-pair, across time, affect spreads and volumes.

Banks can engage in liquidity trades in other OTC market, but these transactions are not observed in the e-MID data set. In this sense our LPI and BPI are local measures, they capture lending and borrowing relationships within the e-MID market only, and not a global measure, as they do not take into account lending and borrowing transactions happening simultaneously in the OTC market. However, we do not claim that relationships are only built within the e-MID market or that these "cause" spreads or volumes. Feedback effects between relationships and prices are possible, with relationships leading to better prices and more favorable prices reinforcing relationships. This feedback loop makes it difficult to establish the causality of the effect. We find nonetheless weak evidence showing that such feedback effects are small and they may not be the main drivers of our relationship effects. Spreads do not determine survival of a bank pair into the following months once relationship indexes are controlled for, while relationship lending has an effect on spreads (and volumes) that is robust to potential survivorship bias. Previous studies (see Hatzopoulos et al., 2015) have shown that, when controlling for banks heterogeneity in trading activity, the matching process in the e-MID market is fairly random. This suggests that links are not preferentially formed with banks that offer lower rates or that are more trustworthy. Rather banks appear to be more likely selected as trading partners because they trade more often. This points to a causal effect of relationship on prices rather than the other way around. In this paper, we do not model the entry and exit decisions of banks and their matching patterns. What we show is that relationships, once formed, possibly at random, persist and are important for explaining spreads and volumes and can play an important role also within a transparent market such as the e-MID.

The identity of the banks trading in the e-MID is unknown to us and replaced by a unique identifier in our dataset. This makes it impossible to match e-MID trading data with balance sheet or other banks' specific data. Other studies (see Angelini et al., 2011) have shown that banks' characteristics such as credit ratings, capital ratios, or profitability remained roughly unchanged during the pre-crisis and crisis period. Neither borrower and lender liquidity nor their shortage of capital correlate with e-MID market spreads in Angelini et al. (2011) study. Of course, since credit ratings lost credibility as the crisis unfolded, we do not know if banks used rating agencies' scores to inform their choices of counterparty. We also do not know what other private or public information was available to banks. For this reason in our analysis we use a panel data model with fixed-effects at the pair-level. Therefore, unobserved characteristics of pairs, as long as they remain "fixed" for all periods are controlled for by pair-level dummy variables.

While the e-MID market is not affected by search frictions and lack of transparency, trading in the electronic segment of the interbank market is affected by its own specific micro-structure features. Gabbi et al. (2012) have shown that due to a bid-ask spread effect, better rates are obtained, both by lenders and borrowers, when they act as quoters rather than as aggressors. A credit institution that first comes to the market with a proposal to lend or borrow is called quoter, while the bank that picks a quote and exercises a proposal is called aggressor. Aggressors, by choosing their counterparts, may have

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