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Fragmentation in the Euro overnight unsecured money market☆

Carlos Garcia de Andoain [a], Peter Hoffmann [b,*], Simone Manganelli [b]

[a] Target & Collateral Division, European Central Bank, Germany

[b] Financial Research, European Central Bank, Germany

HIGHLIGHTS

- We study fragmentation in the Euro overnight unsecured money market.
- We identify several periods of severe market stress.
- Non-standard policy measures broadly reduced market tensions.
- Considerable market fragmentation remained in mid 2013.

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ABSTRACT

This paper examines the degree of fragmentation in the Euro overnight unsecured money market during the period June 2008–August 2013 using interbank loans constructed from payments data. After controlling for cross-country differences in bank risk, we document several episodes of significant market fragmentation. While non-standard measures such as the provision of long-term liquidity were successful in reducing tensions, considerable signs of market fragmentation remained at the end of the sample period.

1. Introduction

The overnight money market represents the initial element in the monetary transmission chain and is therefore of vital importance for the design and conduct of monetary policy. Since the onset of the financial crisis in 2007, central banks around the globe have been spending large efforts in order to contain stress in short-term interbank markets. This has been particularly true for Europe, where the outbreak of the sovereign debt crisis in 2010 led to a reversal of the long-term trend of financial integration that was induced by the adoption of the single currency in 1999 (see e.g. ECB, 2013). Accordingly, several of the ECB's policy measures were taken with the aim of preserving the "singleness" of monetary policy.

Unfortunately, there is little quantitative evidence on the development of the Euro money market throughout the sovereign debt crisis because trading in the interbank market usually takes place over-the-counter.[1] This paper presents an assessment of the degree of fragmentation in the Euro Area overnight unsecured money market for the period mid 2008–mid 2013 based on interbank loans constructed from payments data.[2]

2. Data

Our principal dataset consists of unsecured overnight interbank loans identified from payments data in the ECB's TARGET2

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* Correspondence to: European Central Bank, Financial Research Division, Kaiserstrasse 29, D-60311 Frankfurt am Main, Germany.

E-mail addresses: peter.hoffmann@ecb.int, peter.hoffmann@ecb.europa.eu (P. Hoffmann).

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[1] Exceptions include studies using Italian e-MID data, see e.g. Angelini et al. (2011).

[2] The use of payments data is standard in the literature on the US Fed Funds market, see e.g. Afonso et al. (2011).

Table 1
Country breakdown of banks.

	DE	BE	AT	ES	FI	FR	GR	IE	IT	LU	NL	PT	All
Banks	43	3	10	29	5	8	9	4	54	4	14	15	198
Mean active	24.3	2.6	7.6	19.9	1.9	5.8	6.7	2.5	36.1	2.8	6.9	8.6	124.3
Min active	15	1	5	11	0	3	3	1	29	1	3	5	99
Max active	33	3	10	26	4	8	9	4	44	4	13	12	150

This table provides an overview of the total number of participants by country as well as some statistics on their participation.

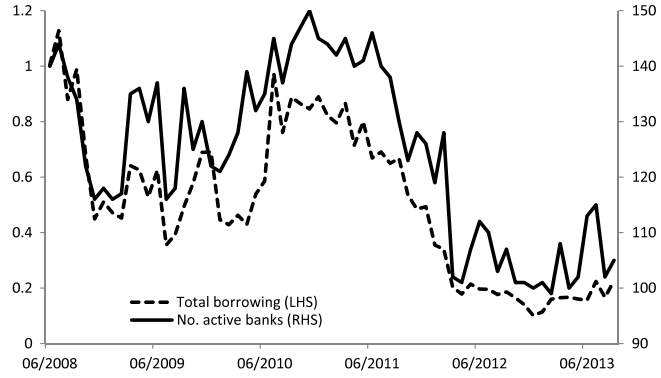

Fig. 1. Borrowing amounts and participation. This figure depicts the total monthly borrowing amount (in trillion EUR) as well as the monthly number of borrowing banks.

settlement system via the Furfine (1999) algorithm. Importantly, the data allows for the identification of the ultimate originator and beneficiary and, accordingly, does not suffer from the large error rates that plague similar dataset based on Fedwire (see Armatier and Copeland, 2012).[3] For each loan, the data comprises the transaction date, the amount, and the annualized interest rate. The sample period is June 2008–August 2013.

Given our focus on bank funding, we only consider gross borrowing. Because most banks transact rather irregularly, we aggregate information on amounts and (weighted average) interest rates at the monthly frequency and at the banking group level. To generate a stable sample, we only consider banks with at least 1 loan in the first and last 6 months of the sample and stem from one of the following 12 countries: AT, BE, DE, ES, FI, FR, GR, IE, IT, NL, LU, PT.[4] This leaves us with a final sample of 198 banks. Table 1 details the geographical composition, while Fig. 1 depicts the evolution of activity over time.

We also collect data on banks' credit ratings from the three major rating agencies (Fitch, Moody's, S&P). Banks are grouped into risk categories based on their average credit rating across all agencies (in case of multiple ratings) in a given month: high (AAA to AA−, or Moody's equivalent), medium (A+ to A−) and low (BBB+ and lower). The averaging across ratings follows Beaver et al. (2006). Non-rated banks are collected in a fourth category, not rated (NR).

Finally, the dataset is complemented with data from banks' participation in the ECB's weekly main refinancing operations (MROs).

3. Methodology

The purpose of this paper is to examine market fragmentation both in terms of funding costs and the ability to meet funding needs. Our methodology is motivated by the law of one price, which states that assets with identical payoffs and risks should command the same price. Accordingly, in a perfectly integrated market, the rate charged for unsecured overnight interbank loans should not vary systematically across countries after controlling for differences in credit risk.

Let $y_{i,t}$ denote the weighted average borrowing rate paid on unsecured overnight loans by bank i in month t, and decompose it into a risk-free rate (y_t), a risk premium based on the bank's risk category r (y_t^r), and a country (or country group) premium (y_t^c):

$$y_{i,t} = y_t + y_t^r + y_t^c + \varepsilon_{i,t}. \tag{1}$$

Perfect integration implies that $y_t^c = 0$ for all countries c and at each point in time t.

The above decomposition can also be applied to banks' ability to access the market for overnight unsecured loans. A market where banks of comparable credit quality face differences in their ability to tap other financial institutions for short-term funding should be considered as fragmented. In order to control for banks' (unobservable) demand for short-term funding, we rely on the idea that institutions that are not able to borrow from other counterparties will ultimately have to resort to the central bank. Let $IB_{i,t}$ denote the total overnight interbank borrowing by bank i in month t, and let $MRO_{i,t}$ be the liquidity drawn from the ECB's weekly main refinancing operation (with 7 days maturity) during the same period.[5] This yields the following measure of banks' (market) funding ability

$$\phi_{i,t} = \frac{IB_{i,t}}{IB_{i,t} + 7 * MRO_{i,t}}. \tag{2}$$

In case a bank does not borrow at all in a given month (neither in the market nor from the Eurosystem), we set $\phi_{i,t} = 1$ because the bank does not resort to public liquidity. This measure can be decomposed in the same fashion as $y_{i,t}$.

4. Results

The decomposition in Eq. (1) for borrowing rates and the corresponding equivalent for banks' funding ability, $\phi_{i,t}$, can be easily estimated via OLS regression on a set of indicator variables corresponding to time-period fixed effects, time-period*country (or country group) fixed effects and time-period*rating-category fixed effects. In all estimations, we cluster standard errors at the bank level.

4.1. Borrowing rates

For illustration, we begin by presenting the results for an estimation based on two country groups, stressed (ES, GR, IE, IT, PT) and non-stressed (the rest). In the notation of Eq. (1), we have $c \in \{S, NS\}$. Fig. 2 depicts the monthly time series of $\hat{y}_t^S$, the estimated

[3] Frutos et al. (2013) verify this dataset with regulatory data from Spain and find error rates of ca. 10%.

[4] Most Portuguese banks join TARGET2 in March 2009, so that we require at least one loan in the first 6 months after this date.

[5] We adjust for the fact that interbank liquidity borrowed on a Friday has a maturity of 3 days. Our results are qualitatively unchanged if we additionally consider resort to the infrequently used marginal lending facility (MLF) and 1-week unsecured interbank loans (constructed via the Furfine algorithm).