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EUROSYSTEM



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# **How to measure the unsecured money market? The Eurosystem implementation and validation using TARGET2 data**

**“Structural changes in money markets: implications for monetary policy implementations”  
ECB workshop - Frankfurt - 1 October 2013**

*The views expressed in this presentation and in the related paper are those of the authors and do not necessarily reflect the views of the European Central Bank, Banca d'Italia or De Nederlandsche Bank. Any errors and omissions are the sole responsibility of the authors.*

**1** TARGET2 payment system

**2** Money market trades

**3** Eurosystem implementation

**4** Validation

**5** Results

## 1 TARGET2 payment system

2 Money market trades

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5 Results

- PAN European Large Value Payment System (RTGS)
- 1,100 direct participant and 3,400 indirect participants
- Daily turnover EUR 2,700 billion
- Daily number of transactions 350,000
- Average transaction value EUR 7.7 million
- TARGET2's share in total large-value payment system traffic in euro was 92% in value terms and 57% in volume terms

1 TARGET2 payment system

**2 Money market trades**

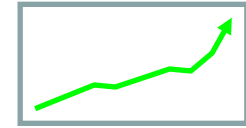
3 Eurosystem implementation

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# Money market trades – 1/3

Date: Tuesday, 1 October 2013



Fred

$$\begin{aligned} &100 \text{ mln} \\ &* 0.001 \\ &* (1 / 360) \\ &= 277.78 \end{aligned}$$

$$\begin{aligned} &100 \text{ mln} * 0.13 \\ &* (3 / 360) \\ &= 1,083.33 \end{aligned}$$

Lara speaking...

Hi, it's Fred  
I need a 100 mills overnight..

OK, that's possible Fred,  
I'm asking 10 bp

Agreed  
Rate amount is 277.78

One moment Lara,  
can we agree on Friday?

That's a bit difficult...  
then I'm asking 13 bp

Agreed !  
Rate amount is 1,083.33  
Thanks, see you

Bye bye Fred

Hmm, EONIA is 8  
bp..I'll ask for 10 bp

Well, he definitely needs  
cash...let me rise to 13 bp

Hmmm that was VERY  
quickly agreed...next time  
I will start negotiations at  
Eonia + 3 bp



Lara

In TARGET2 there will be two payments:

- Tuesday 1 October, Lara -> Fred EUR 100,000,000.00
- Friday 4 October, Fred -> Lara EUR 100,001,083.33

Loan amount, agreed annualized rate and maturity lead to accrued amount

Rates lie (usually) around EONIA

Reputation of a bank is the result of a delicate process



Identification of money market trades in payment systems data by means of the Furfine (1999) algorithm:

Matching of..



- payment on day  $t$
- from participant **A** to **B**
- amount **X** (rounded to 1 million dollars)

- payment on day  $t+1$
- from participant **B** to **A**
- amount **X** + **plausible interest rate**

## **Fedwire (US)**

Furfine (1999), Furfine (2001), Demiralp *et al.* (2004), Afonso *et al.* (2011), Armantier and Copeland (2012), Kuo *et al.* (2013), ...

## **CHAPS (UK)**

Millard and Polenghi (2004), Whetherilt *et al.* (2010), Jurgilas and Žikeš (2012), ...

## **Other payment systems**

Hendry and Kamhi (2007) – Canadian LVTS

Akram and Christophersen (2010) – Norwegian NBO

Heijmans *et al.* (2010) – TARGET2-NL

...

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## Scope

Suitable for the whole euro area

## Maturities

Maturities up to three months reliably estimated (with a high degree of uncertainty also maturities from three months to one year)

## Validation

“Furfine” algorithm validated for the first time with subsections of the whole euro area money market data (e-MID and EONIA)

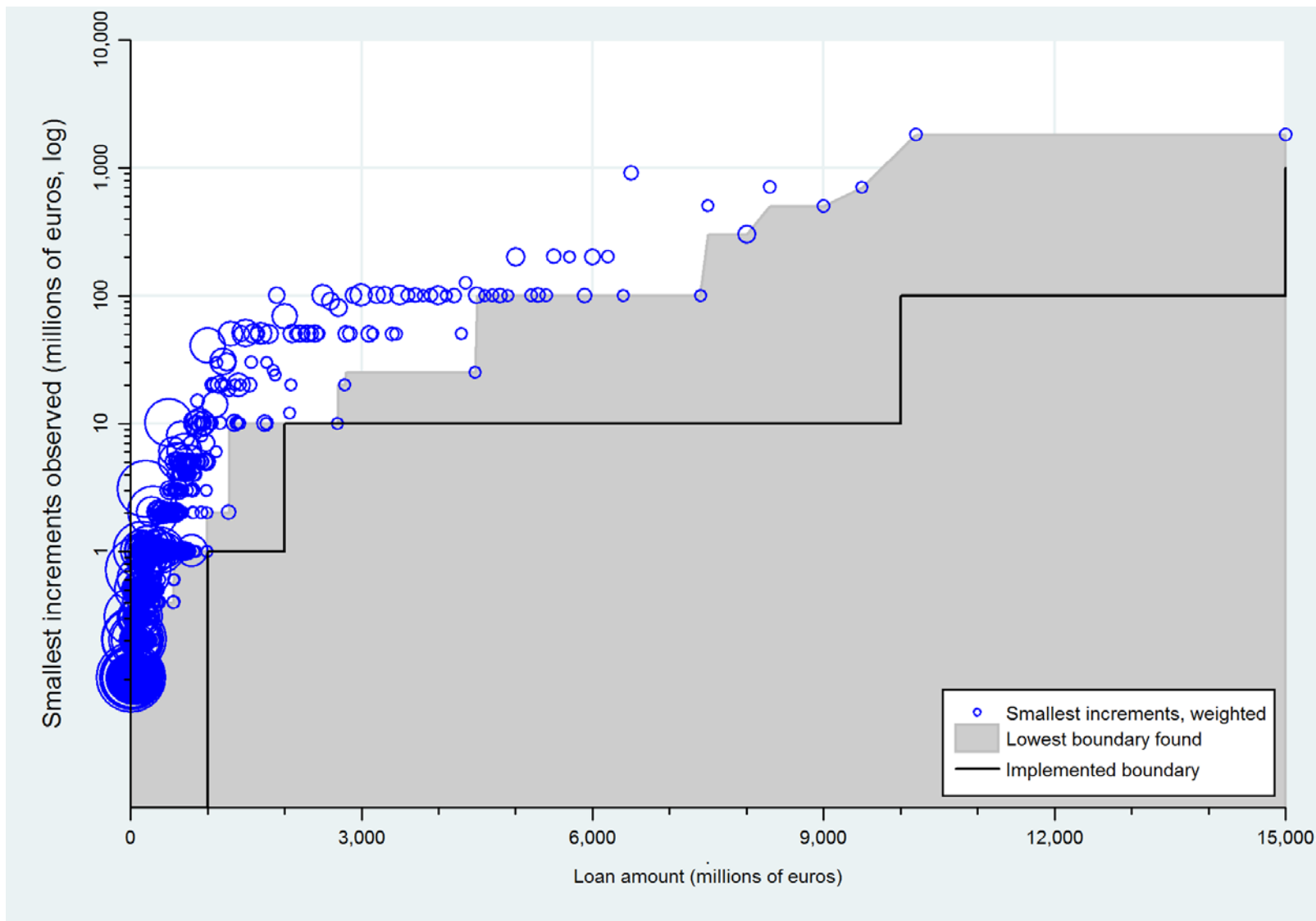
## Data

- a. Only bank-to-bank payments and selected ancillary systems transactions
- b. Removing intra-group transaction using Group BIC consolidation based on SWIFT directory
- c. Limitation due to the missing ordering and beneficiary information

## Loan and increment

- a. Minimum loan value, EUR 1 million
- b. Loan increments depending on loan values

# Eurosystem implementation – 2/6



## Corridors

- a. ECB corridor (Overnight Deposit and Marginal Lending)
- b. ECB corridor 25 bps (OD-25 bps and ML+25 bps)
- c. EONIA/EURIBOR 25 bps
- d. EONIA/EURIBOR 50 bps
- e. EONIA/EURIBOR 100 bps

## Plausible interest rates

- a. Must be within corridor
- b. Only interest rates rounded to  $\frac{1}{2}$  basis points are considered plausible

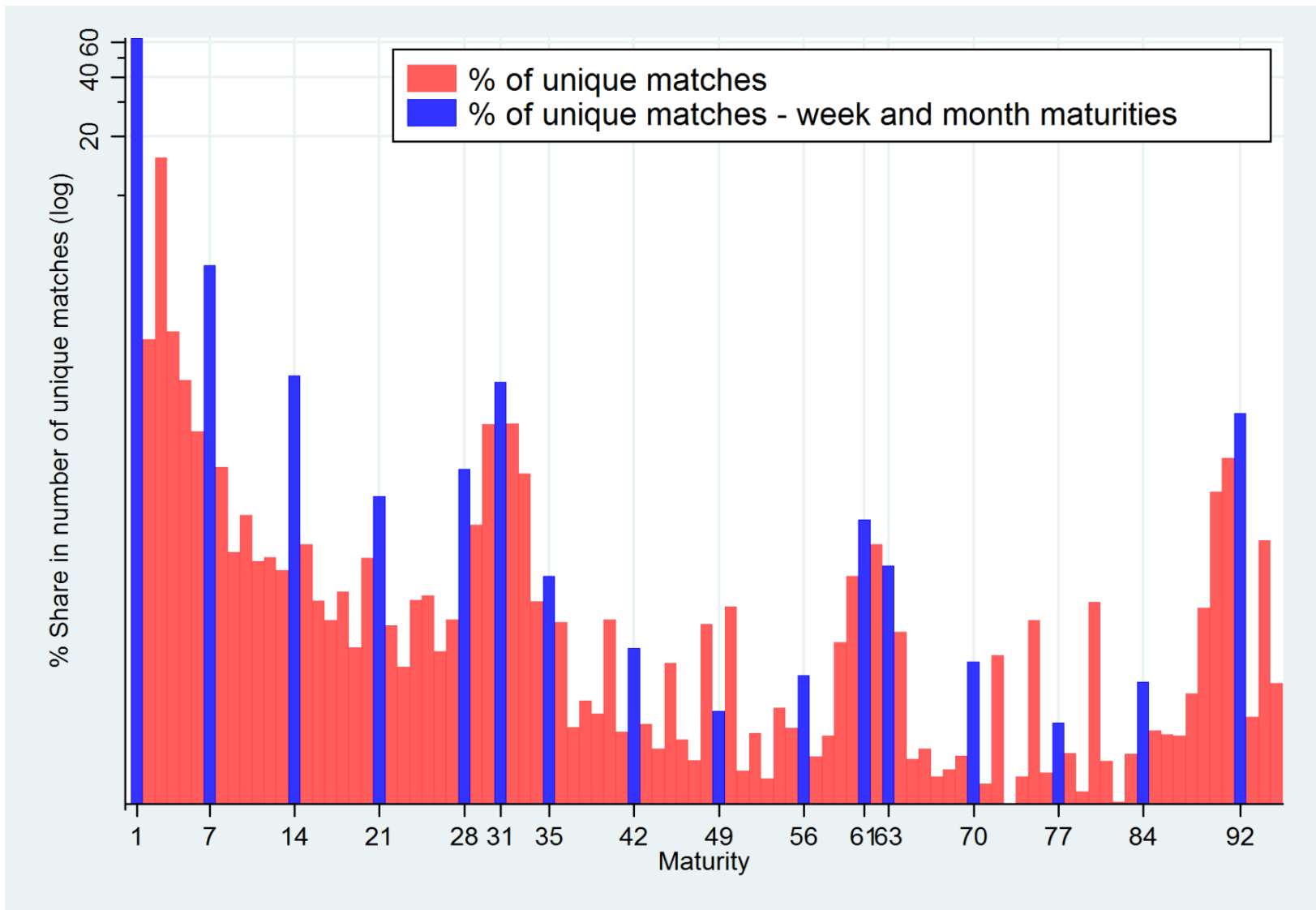
## Multiple matches

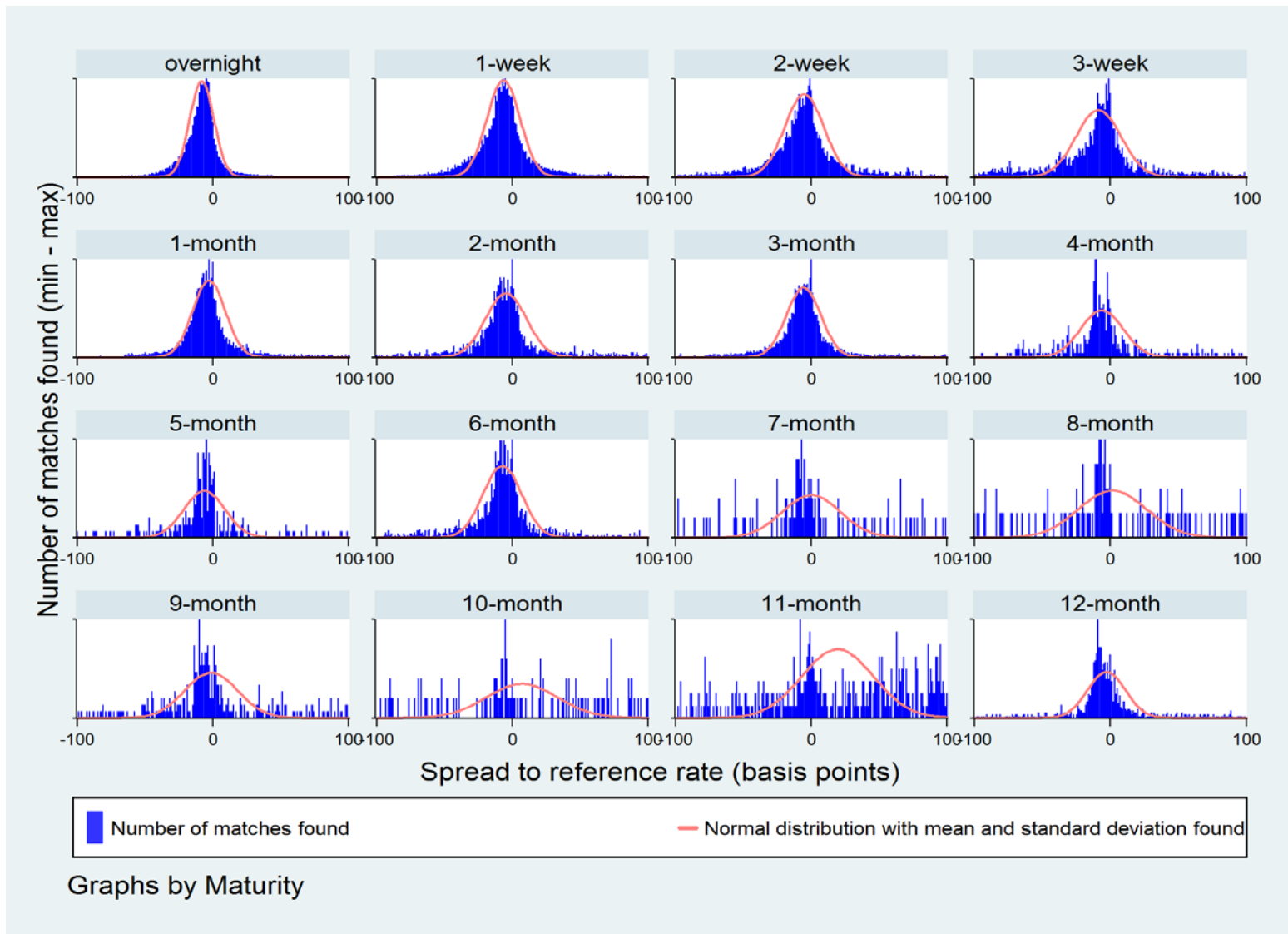
- a. Multiple matches possible (matched loan not taken out)
- b. Most plausible duration will be chosen on number of unique matches per duration
- c. Information on choice is kept in the final dataset

## Maximum durations

- a. Up to 3 months reliably estimated
- b. Loans with maturity from 3 to 12 months to be interpreted with caution







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## Cross-check with e-MID data

- a. Italian electronic money market system for all maturities, with participation of foreign banks and sizeable market share until end 2009 (euro-area benchmark)
- b. Two validation strategies, depending on the settlement procedure
- c. Corridors ECB 25 bps and EONIA 100 bps perform best (in terms of false negatives in the overnight segment - 0.92% to 1.96%)
- d. Significant improved results compared to Armantier and Copeland (2012)



## Cross-check with EONIA data

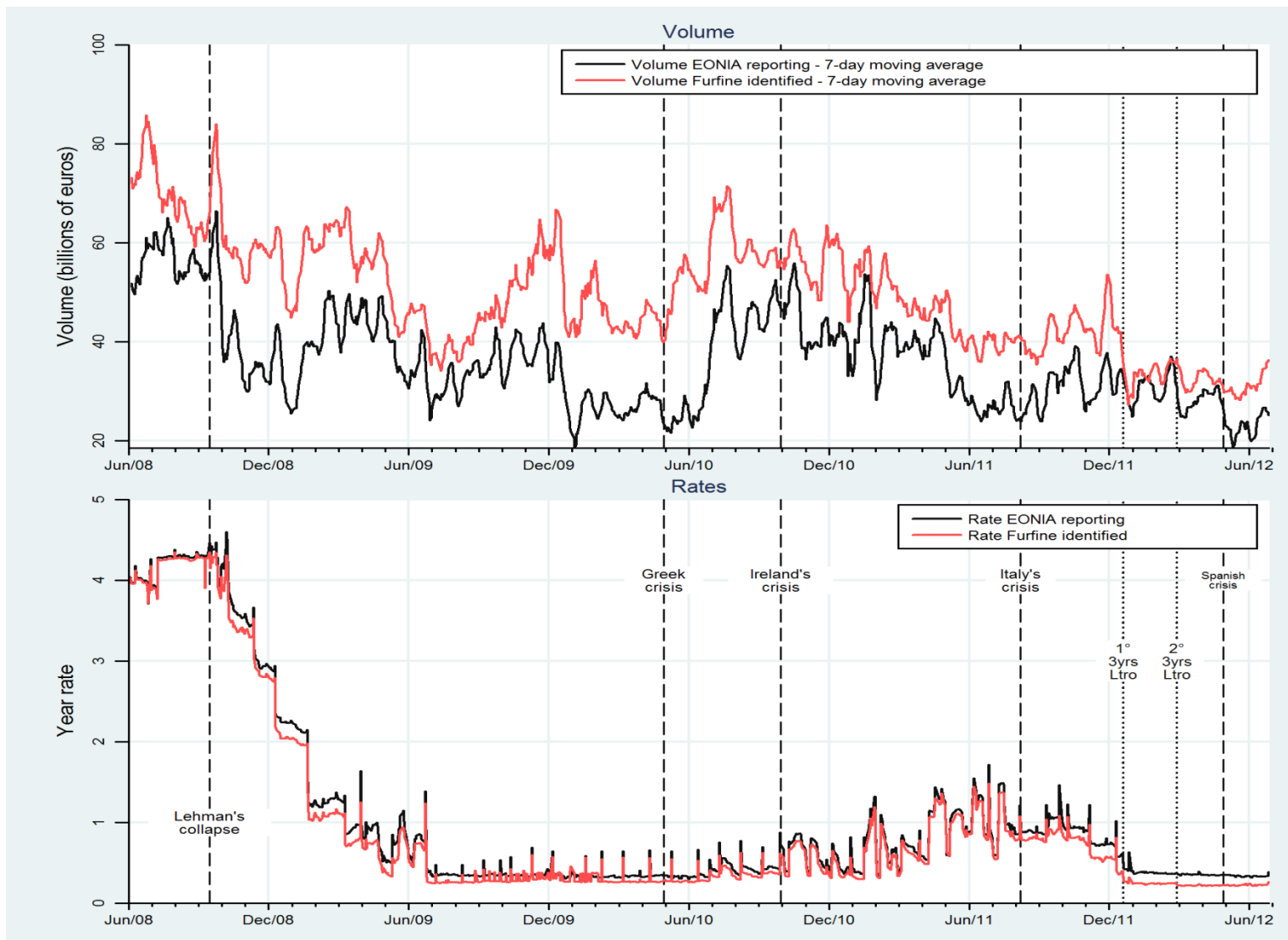
- a. Weighted average rate of all unsecured overnight lending transactions and total volume (euro-area benchmark)

## Higher turnover identified

- a. Loans concluded on behalf of clients
- b. Tomorrow-next and spot-next transactions included in TARGET2 data
- c. Possible over-identification

## Lower turnover identified

- a. Loans settled on the accounts of a commercial bank
- b. Transactions settled via another payment system, e.g. EURO1



1 TARGET2 payment system

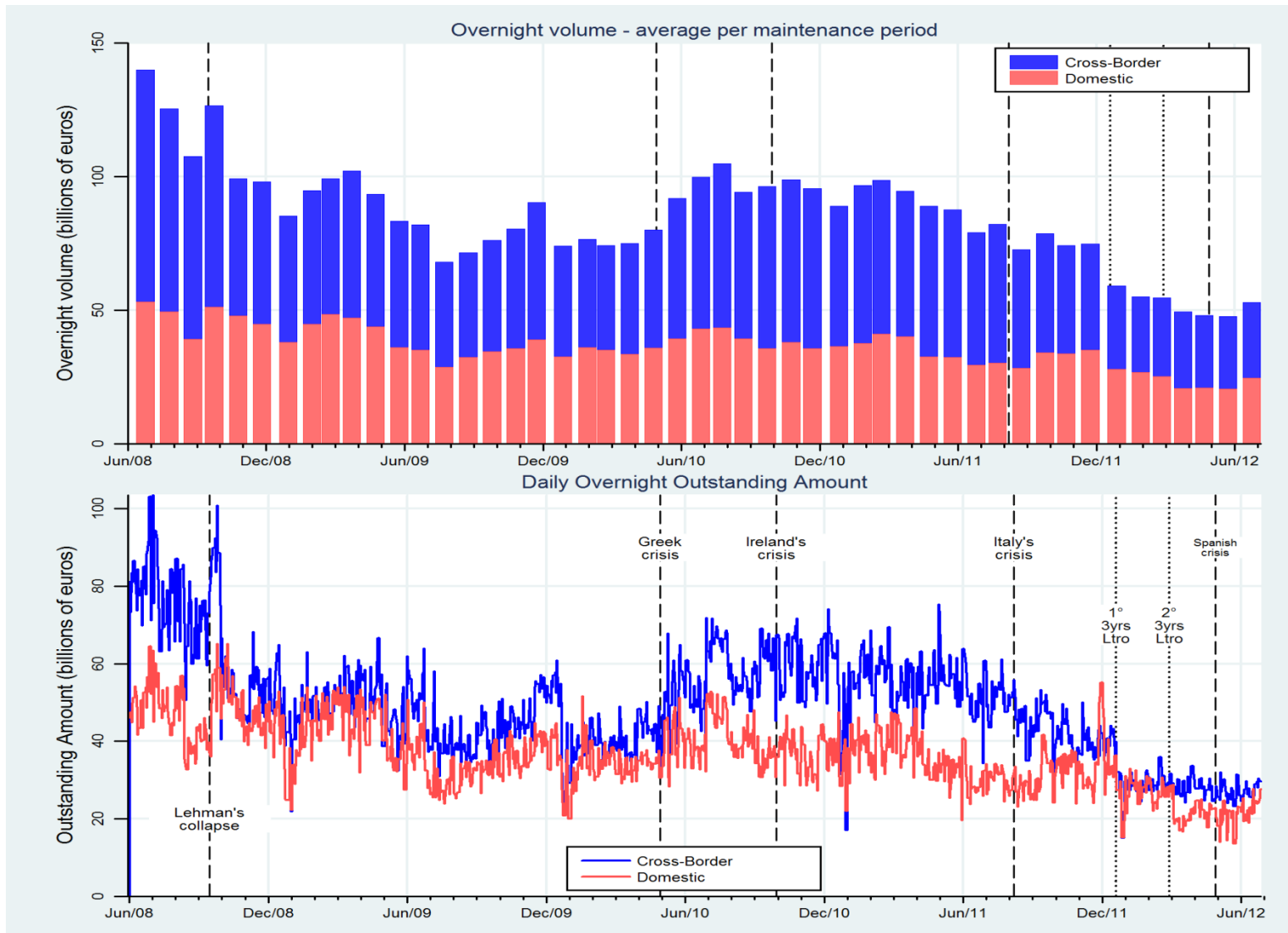
2 Money market trades

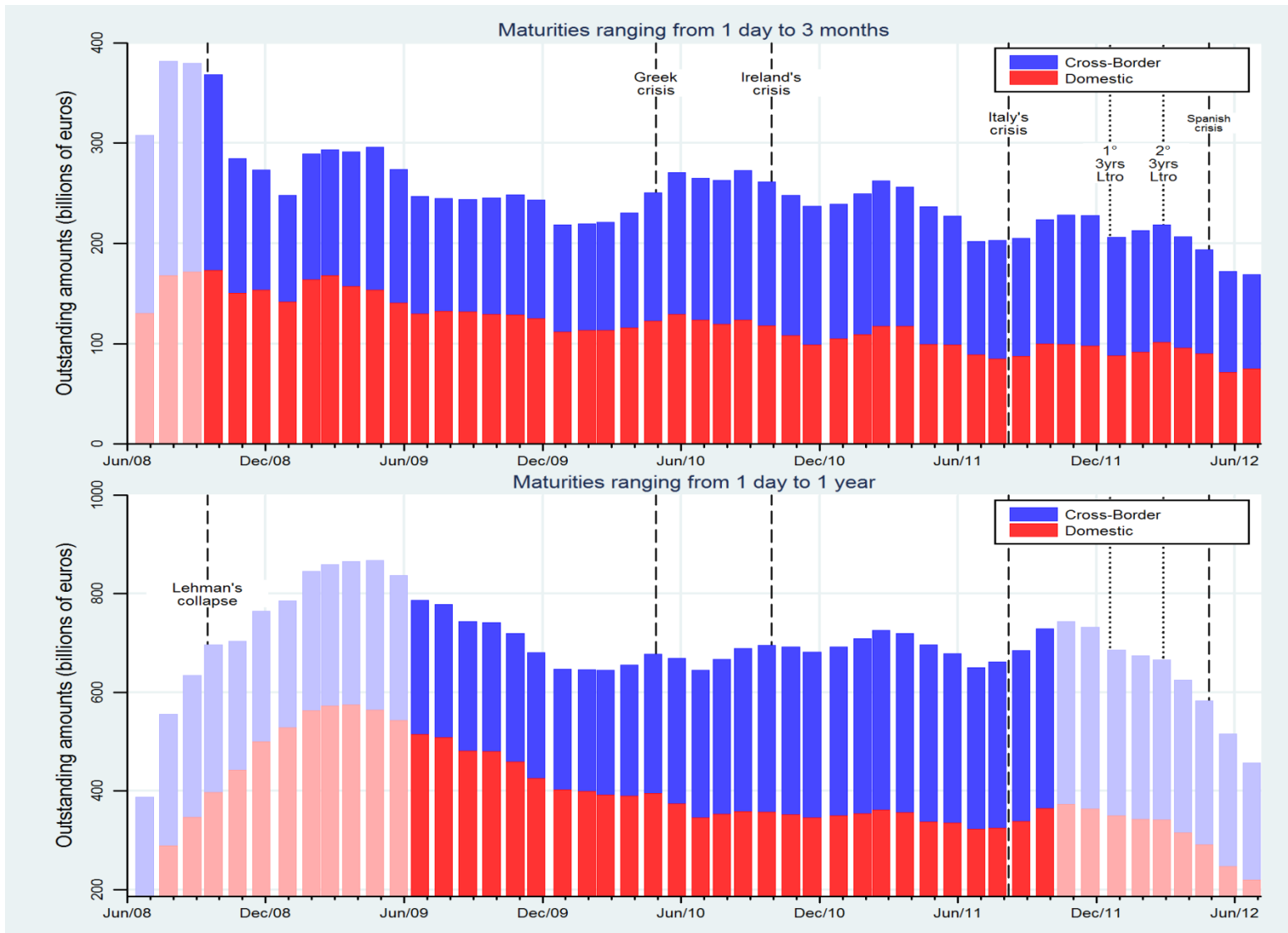
3 Eurosystem implementation

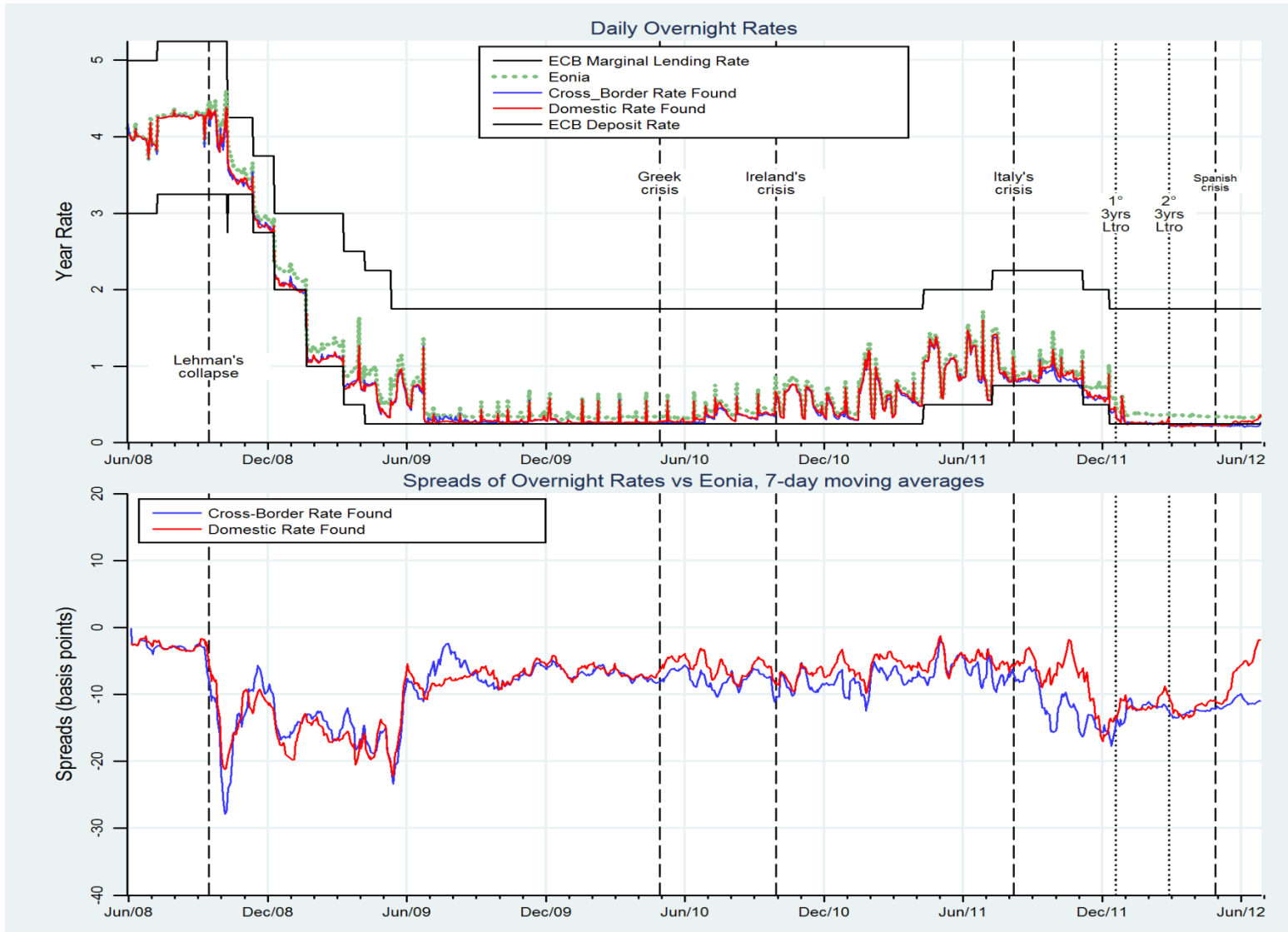
4 Validation

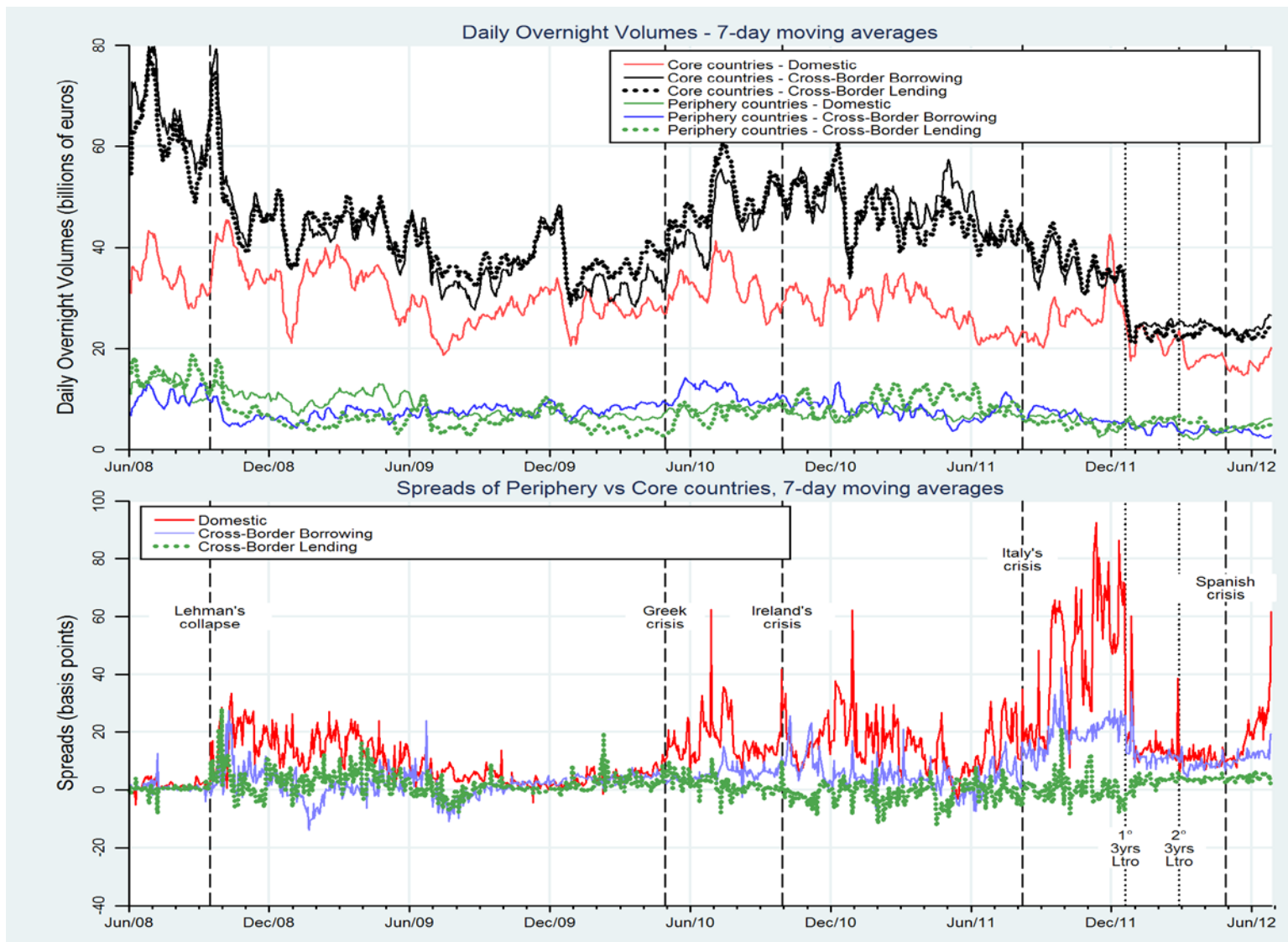
**5 Results**

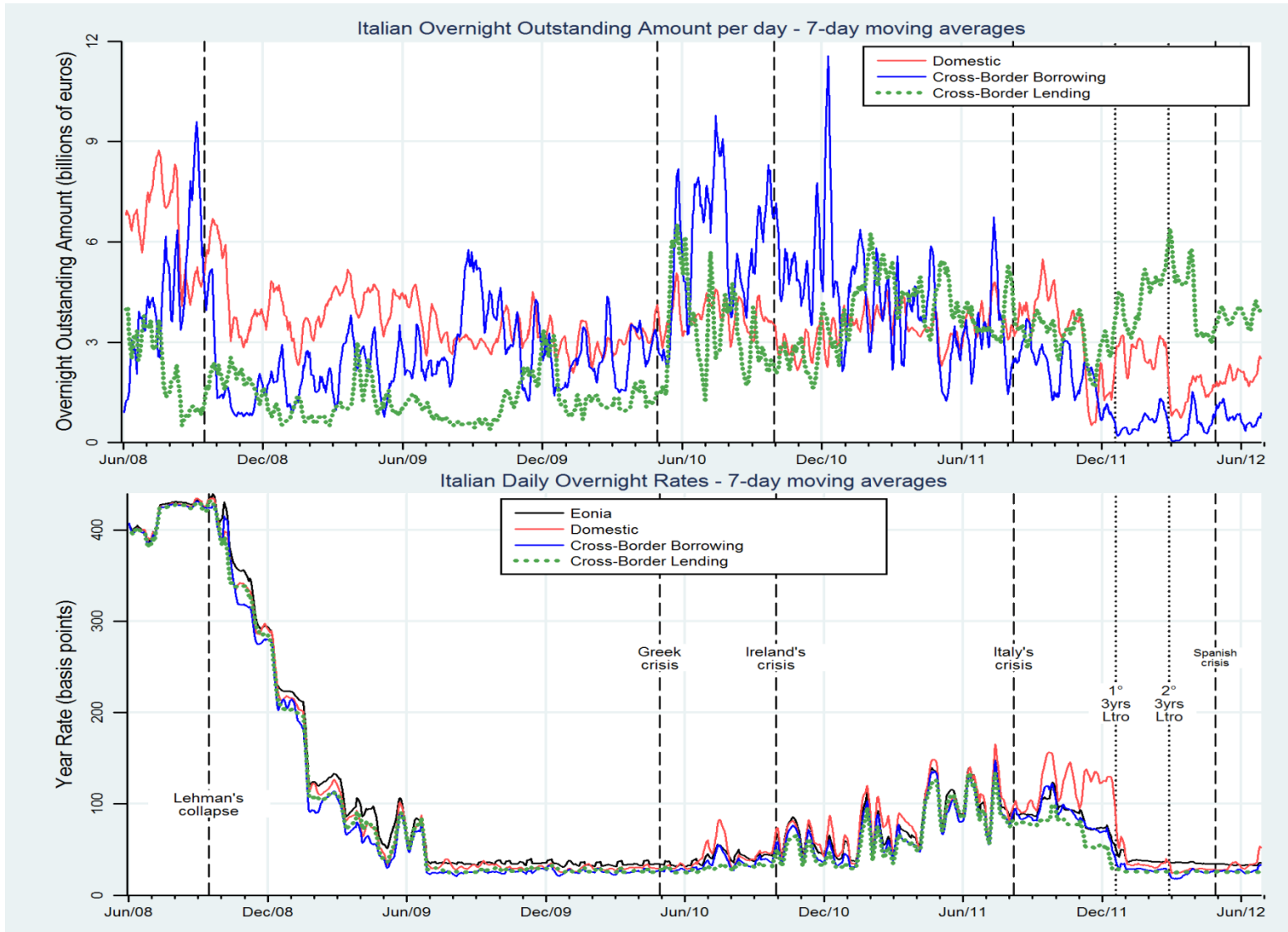












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*Thank you for your attention!*

