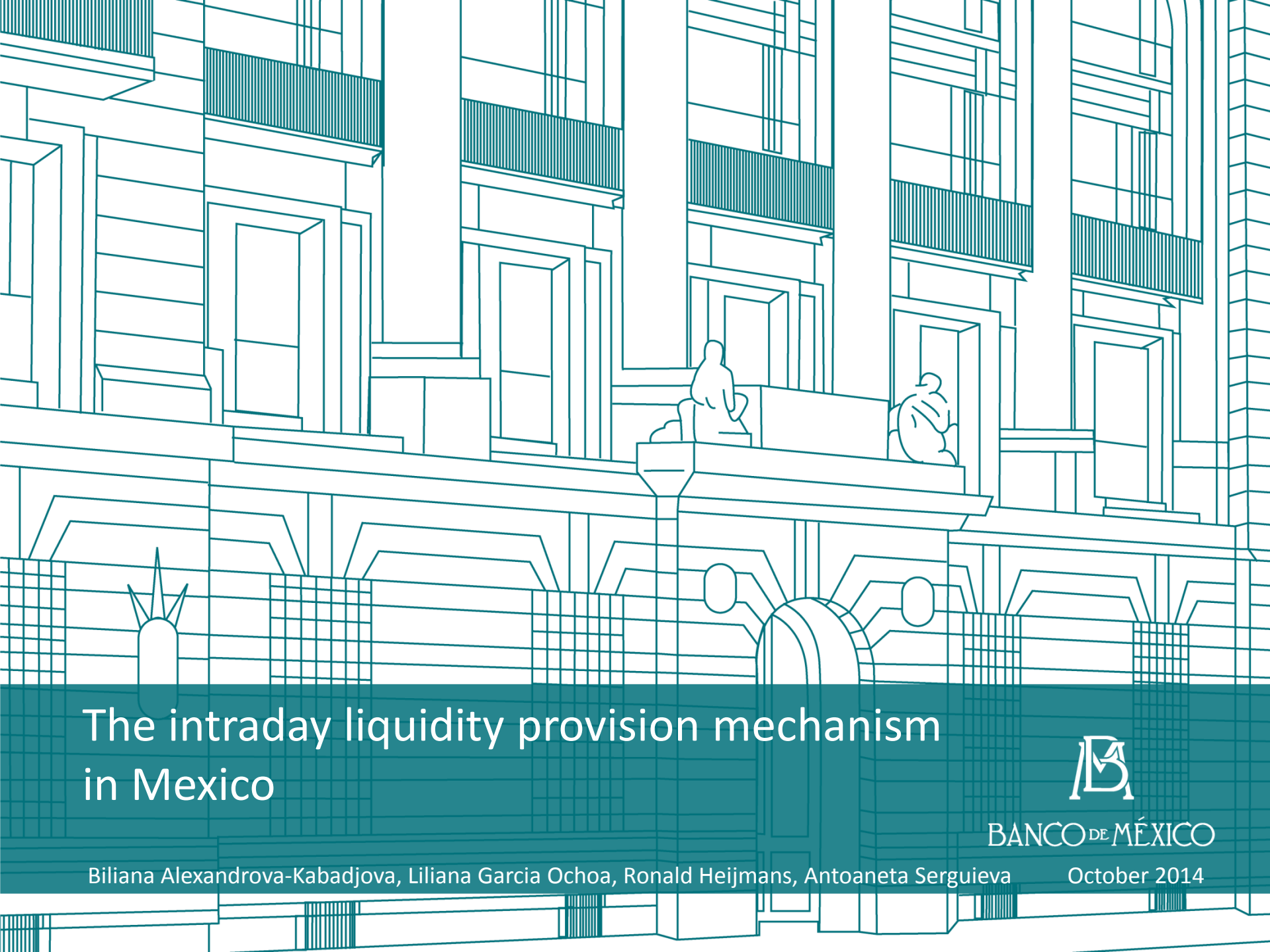

The intraday liquidity provision mechanism in Mexico

BANCO DE MÉXICO

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October 2014

Background*

- Payment methods and systems have evolved over time
- Financial Market Infrastructures (FMI) are economic platforms that facilitate the clearing and settlement of electronic transactions
- Ongoing innovation is likely to diversify payment types competing on the consumer-service level, whereas integration efficiency and cost reduction could be the key reasons for aggregating payments processing and settlement
- Potentially, in the near future, all types of electronic payments, even card payments, could be settled together
- To achieve this goal, settlement engines need to incorporate a liquidity-saving mechanism which allows settlement of a large number of low-value payments with minimum pressure on liquidity consumption

*The views presented in this study are exclusively those of the authors and do not necessarily reflect those of Banco de México

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1. Introduction

2. Liquidity provision and the methodological approach

3. Future work

Introduction

- Our purpose is to elaborate a methodological approach to study the flow of funds in large-value payment systems (LVPS) as a financial market infrastructure (FMI)

- The algorithm presented allows us to put payments flow into two categories:
  - The first relates to the LVPS participants' management of external funds, i.e., funds transferred from other FMIs or provided by a central bank
  - The second relates to the reuse of incoming payments. Based on transactional data, the algorithm evaluates to what extent incoming payments are used to cover obligations

- The approach is applied to study the flow of intraday liquidity under the framework of its provision within the Mexican FMIs, in particular, within the payment system SPEI®, and between SPEI® and the securities settlement system DALÍ

- The aim is to evaluate the impact of intraday liquidity provision and understand how liquidity is transmitted to SPEI® participants

- The present study is part of a project aimed at building a model that incorporates network structure and FMI participants' behavior

- The model will allow assessment of the impact of policy decisions on liquidity provision as well as the effectiveness of measures taken to strengthen the soundness of the FMIs

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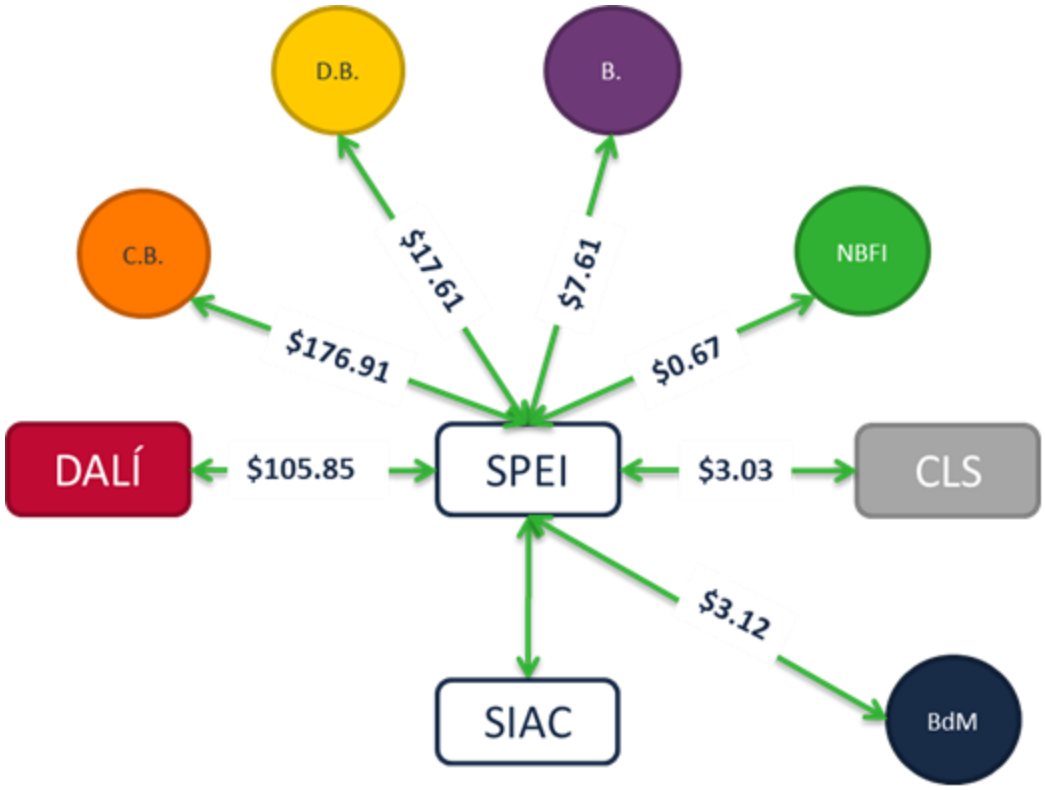
The Mexican Large-Value Payment System (SPEI)

- In Mexico, the LVPS called SPEI® is equivalent to a real-time gross settlement (RTGS) system which enables low- and large-value payments between financial institutions and third parties (clients) to be processed simultaneously during opening hours

- The system is operated by Banco de México (BdM) and settled around 895,000 transactions daily on average in 2013
  - More than 93% of the obligations are payments with a value lower than US$10,000
  - Around 0.5% of the transactions surpass US$1 million

- There are 98 direct participants in SPEI®, within four categories:
  - Private multiple-purpose banks (commercial banks)
  - Public development banks
  - Brokerage houses
  - Other nonbank financial institutions

SPEI transaction volume



BdM - Banco de Mexico
DALÍ - the Mexican Security Settlement System
SIAC – the system holding current accounts for the banks, allowing direct access to liquidity provided by BdM
B - Brokerages
CB – Private multiple-purpose banks (commercial banks)
DB - Public development banks

Aggregated data per sector and per FMI processed for 2013

The project´s development

- First stage - accounting only for multiple-purpose banks from the perspective of large- and low-value payments
  - Alexandrova-Kabadjova and Solís-Robleda, 2012 study commercial banks' behavior by evaluating the need for external funds and the degree of recycled payments per participant
  - Martinez-Jaramillo et al., 2014 evaluate the network structure and identify the dominant players
- Second stage – considering all direct participants in SPEI
  - Alexandrova-Kabadjova et al., 2014a look at liquidity provision and provide a framework to evaluate its impact on participants' behavior in managing funds
  - Alexandrova-Kabadjova et al., 2014b determine the overall structure of the network in order to identify components and measure the degree of connectivity
- Third stage – considering all direct participants in SPEI
  - The aim is to analyze the network structure of two different types of payments – payments initiated by third parties and payments initiated by participants
  - A second goal is to study the behavior of the participants by accounting for the two different types of payments

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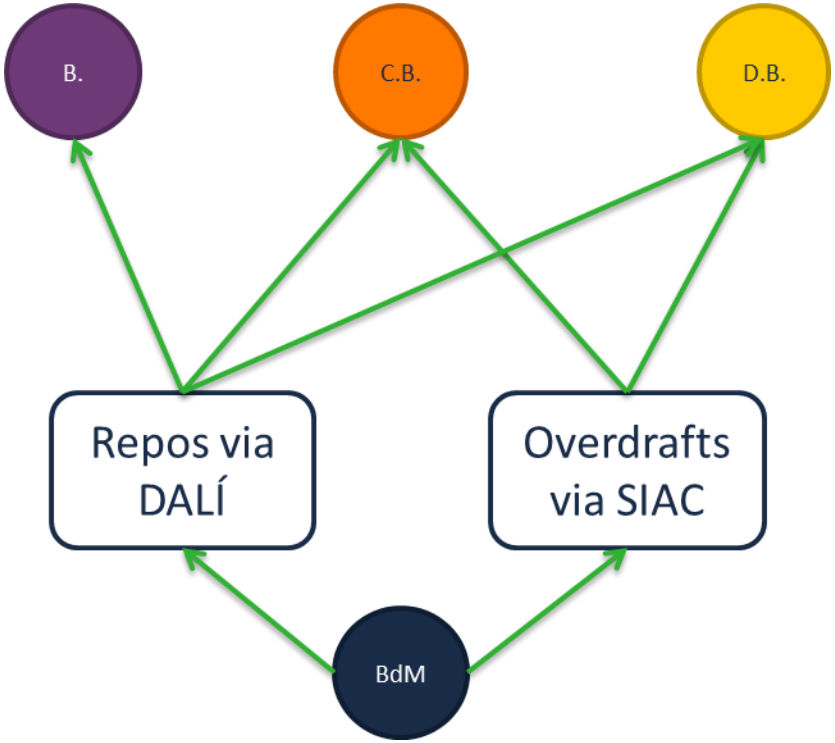
Liquidity provision



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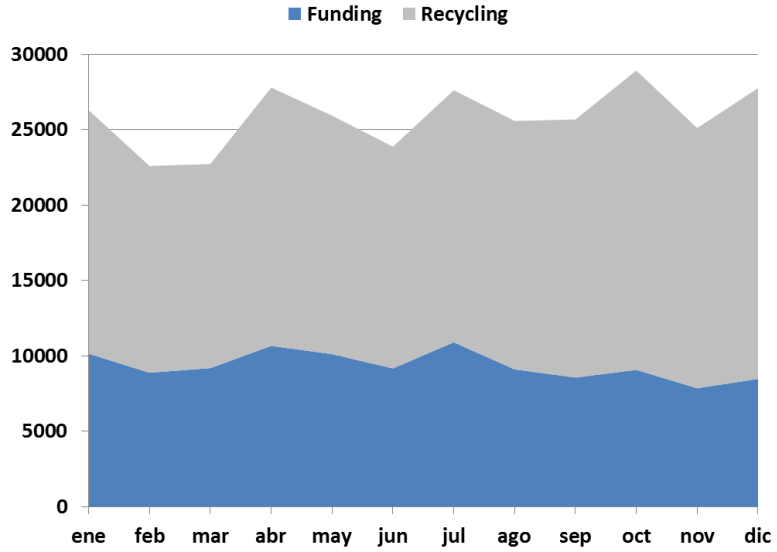
The algorithm

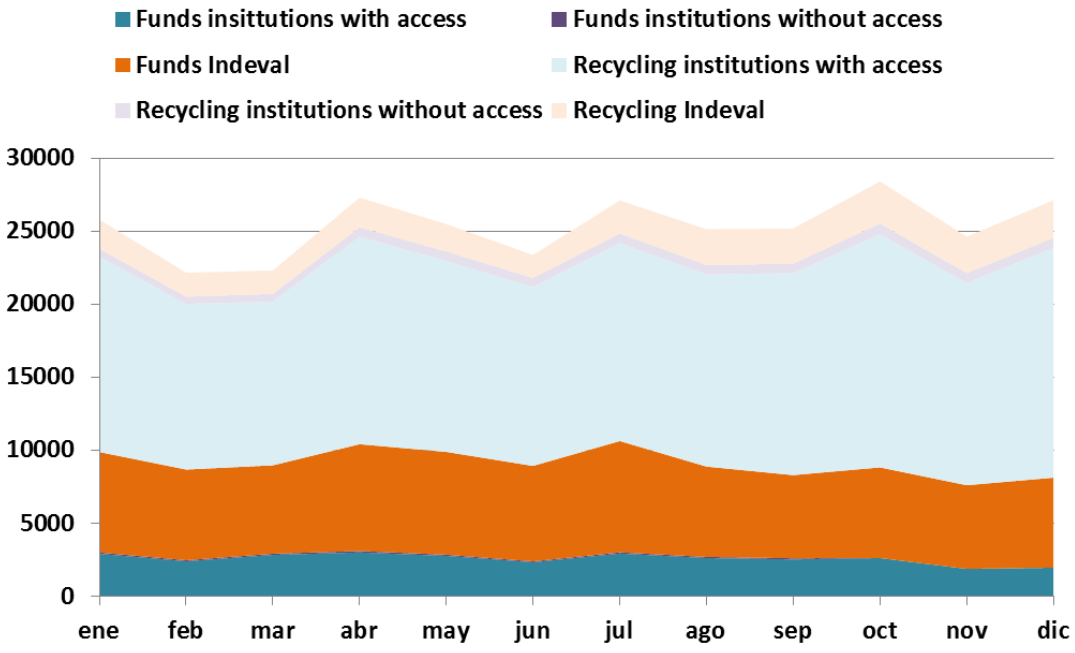
- Let I be the set of participants in SPEI and T the set of cycles in one day
- We define $\mathcal{P}_{it}^{rec}$ as the sum of the amount of payments received by each $i \in I$ in each cycle $t \in T$
- Whereas $\mathcal{P}_{it}^{sent}$ is the sum of the amount of payments sent by each participant $i \in I$ in each cycle $t \in T$
- Let S_{it} be the positive balance of each participant $i \in I$ in each cycle $t \in T$, given that $S_{i0} = 0$ for all i
- Further we define F_{it} as the amount of own funds for each $i \in I$ in each $t \in T$ calculated according to the transactional data, given that $F_{i0} = 0$ for all i
- For each cycle let $A_{it} = \left(\mathcal{P}_{it}^{rec} - \mathcal{P}_{it}^{sent}\right)$
  - If $(S_{it-1} + A_{it}) < 0$
  - Then
    - $F_{it} = F_{it-1} - (S_{it-1} + A_{it})$
    - $S_{it} = 0$
  - Else
    - $S_{it} = (S_{it-1} + A_{it})$

Funding vs. recycling on a daily basis

- One-third of all transactions processed in SPEI are covered with external funds, and the remaining two-thirds are recycled



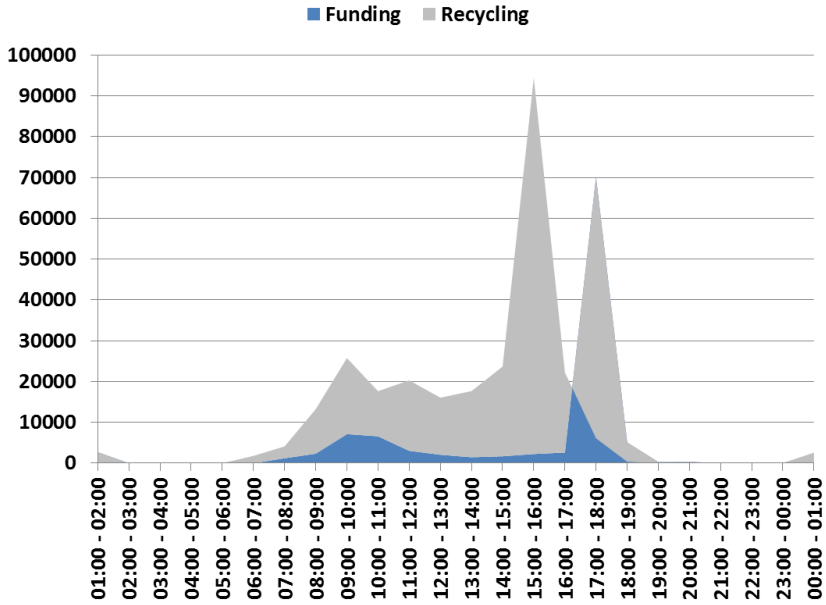
General perspective



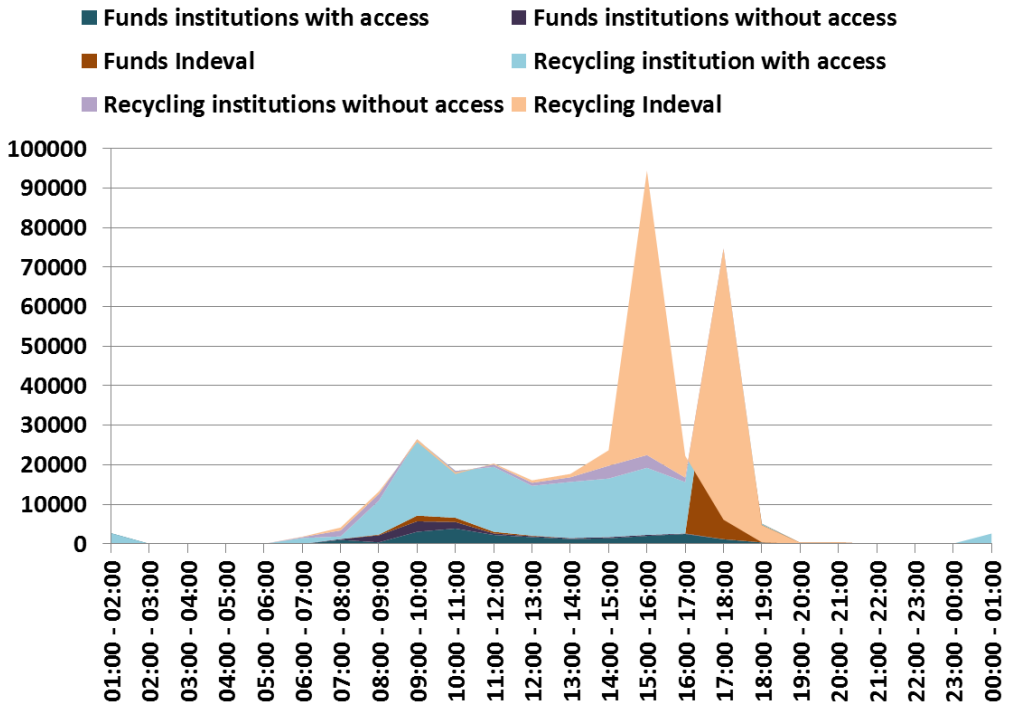
Per sector

Transaction data as of 2013

Intraday funding vs. recycling



General perspective



Per sector

Transaction data as of 2013

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Participants' behavior

Measuring observed behavior

Modelling behavior

Measuring modelled behavior

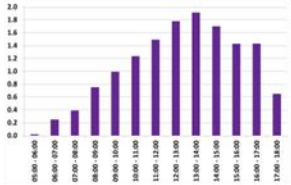
Existing rules

BM

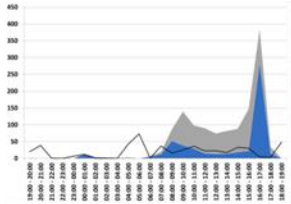
BD

CB

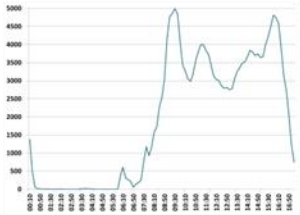
IFNB



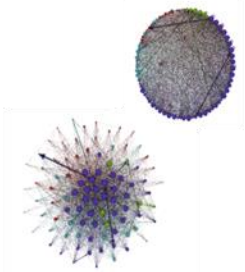
High Frequency Data (SPEI)



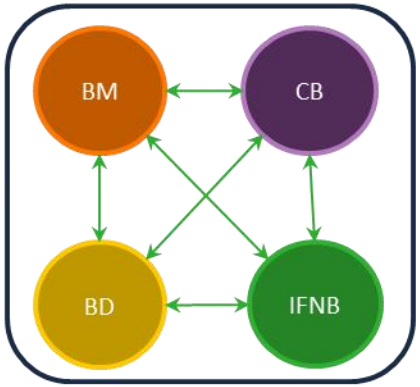
Overdraft (SIAC) – Repos (RSP)



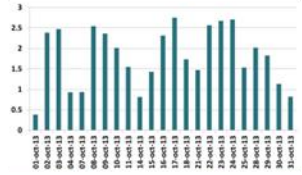
Securities transactions (DALI)



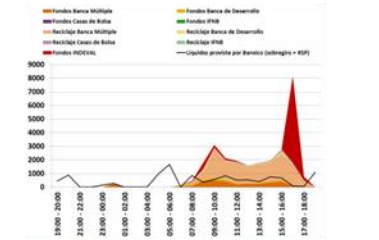
Network description



Testing new rules



High Frequency Data (SPEI)



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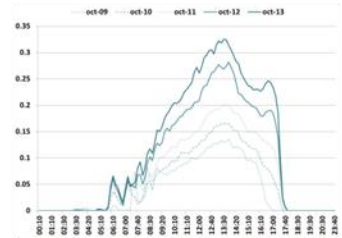

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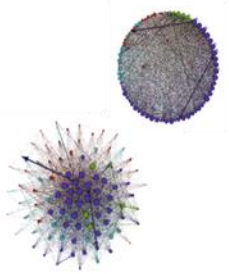

Network description

Final remarks and future work

- We have gained insight on the dynamics of the network structures from different perspectives
- We have studied the behavior of SPEI® participants by calculating the need for external funds and the degree of recycled payments
- We should evaluate to what extent a payment initiated by a third party increases the demand for liquidity or allows for lower pressure through recycling
- We need to gain more insight on the mechanism of redistribution of funds among participants through unsecured/secured lending
- We should build an agent-based model to test new rules on policy decisions on liquidity provision and measures taken to strengthen the soundness of the FMIs


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