Intraday Liquidity Management

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Payments Week – 2007

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Agenda

- Overview
- Intraday liquidity management
- Payment flows maximization
- Forms of economizing liquidity
- Monetary policy effects
- Concluding remarks
Overview – Main variables

• Payments Volume
• Demand and supply of total reserves
• Network of interbank exposure
• Distribution of liquidity amongst banks
• Opportunity cost of holding reserves or collateral and cost of intraday liquidity
• Bank reputational cost
• Payments delay
• Possible impacts on monetary policy
# Overview – Liquidity Sources

<table>
<thead>
<tr>
<th>Liquidity Sources</th>
<th>Banking credit cost</th>
<th>Banking tendency to delay payment</th>
<th>Central Bank Credit Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>uncollateralized overdraft</td>
<td>no cost</td>
<td>no delay</td>
<td>credit risk</td>
</tr>
<tr>
<td>collateralized credit</td>
<td>opportunity cost of collateral maintenance</td>
<td>relationship between opportunity cost and reputational cost</td>
<td>issuer risk</td>
</tr>
<tr>
<td>costly credit</td>
<td>intraday credit interest rate</td>
<td>delay</td>
<td>credit risk</td>
</tr>
<tr>
<td>excess of reserves</td>
<td>opportunity cost</td>
<td>relationship between opportunity cost and reputational cost</td>
<td>no risk</td>
</tr>
<tr>
<td>endogeneous liquidity of payments</td>
<td>no cost</td>
<td>delay</td>
<td>no risk</td>
</tr>
</tbody>
</table>
Overview – Liquidity Supply in Brasil

- Reserve requirements
- Intraday collateralized credit
- Association of money market operations
- Payment delay
- Queuing
- Optimization algorithm
- Implicit interbank market
Intraday Liquidity Management – Demand – daily average R$ billion
Intraday Liquidity Management – Approach

- Intraday liquidity =
  - Balance of reserve account
  - Balance of reserve requirements
  - Central Bank’s intraday credit eligible portfolio

- Construction of the intraday liquidity curve throughout the day

- Liquidity Effective Need (NEL)
  - Sum of the higher difference between the intraday liquidity balance and its final balance of all institutions.
Intraday Liquidity Management – Liquidity Effective Need
R$ billion

Federal public securities requirements in the Central Bank
Federal public securities
Reserve requirements
Reserves at the beginning of day
Liquidity effective need
Intraday Liquidity Management – Liquidity Effective Need Distribution

<table>
<thead>
<tr>
<th>Class</th>
<th>2006 2nd semester</th>
<th>2007 1st semester</th>
</tr>
</thead>
<tbody>
<tr>
<td># of FIs</td>
<td>%</td>
<td># of FIs</td>
</tr>
<tr>
<td>0% to 10%</td>
<td>45</td>
<td>12</td>
</tr>
<tr>
<td>10% to 20%</td>
<td>41</td>
<td>14</td>
</tr>
<tr>
<td>20% to 30%</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>30% to 40%</td>
<td>2</td>
<td>24</td>
</tr>
<tr>
<td>40% to 50%</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>50% to 60%</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>60% to 70%</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>70% to 80%</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>80% to 90%</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>90% to 100%</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>109</td>
</tr>
</tbody>
</table>

1/ Percentage of payments.
Minimum cost of systemic liquidity – Percentage of Reserves

- 55%
- 50%
- 45%
- 40%
- 35%
- 30%

Jun/02  Aug  Oct  Dec  Feb/03  Apr  Jun  Aug  Oct  Dec  Feb/04  Apr  Jun
Association of Money Market Operations – Daily average R$ billion
Queue of Payments – Average Time
Delaying of Payments – Intraday Profile

% Value

Accumulated %

Volume

Standard deviation range
Average percentage
Accumulated average percentage

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Delaying of Payments – Money Market Effect

• Although significant in terms of volume, the delaying of payments is not binding in terms of value;
• Correlation between funds transfer and money market operations at the end of the day is relatively low;
• Low relative volume of funds transfer at the end of the day comparing to the volume of transactions on money market throughout the day;
• Low difference between interest rates on transactions at the end of the day and the average interest rate;
• Even with extremely low interest rates at the end of the day caused by payments delay, there is no significant pressure on the average daily interest rate;
• Low pressure of payments delay in money market;
Implicit Interbank Market – Preliminary Results

- Micro data analysis
- Selic overnight interbank market
- Interest rate decomposition per operation
- Statistically significant parameter for “Time duration of the operation” (proxy for implicit intraday market)
- Average cost of intraday credit implicit on the overnight market operations estimated as 0.0076% per work day, 10.9% of the overnight money cost.
Intraday Liquidity Supply – Possibility of Pricing According to Shadow Prices

• Optimization of payment flow on a RTGS system;
• Model parameters:
  • Intraday liquidity variable policy
  • Haircut of the value of different security eligible for intraday credit
• Each security eligible for intraday brings different payment flow to the market
Intraday Liquidity Supply – Possibility of Pricing According to Shadow Prices

• Possible applications
  • Pricing of the collateral corresponding to the payment flow it might bring to the market
  • Possibility of acceptance of other banks' assets as collateral for intraday liquidity

• Implication
  • Minimization of the exposition of the central bank to the issuer risk
  • Maximization of the payment flow
  • Reduced liquidity supply offered by the Central Bank
  • Current excess of liquidity makes the differentiation binding
• Currently high cost liquidity sources
• Liquidity excess caused by restrictive Monetary policy
  
  • High interest rates
  • High reserve requirements

• In the first half of 2007, STR, the Brazilian LVTS, had an average daily turnover of only 107% of its total liquidity supply

• Inefficient in payment system point of view

• Low impact of payment system on monetary policy implementation
Intraday Liquidity Management in Brazil
Concluding Remarks – II

- Scenario: maintenance of the current trend of Monetary policy relaxation
- Trend to reduce current costly liquidity sources
- Possibility of implementation of less costly liquidity sources
  - Intraday credit accounting for shadow prices
  - Optimization algorithm
- Trend of better coordination and liquidity management from the banking system, guided by Central Bank incentives
- Higher efficiency of the system
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