OPERATIONAL RISKS IN ReGIS
A SYSTEMICALLY IMPORTANT PAYMENT SYSTEM

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Outline

- NBR's role in payment systems
- ReGIS payment system main features
- Why financial stability cares about ReGIS payment system?
- Statistics on ReGIS payment system for September – December 2008
- Domestic financial system distressed in October 2008
- Operational risk in the payment system
- Scenario 1 (medium intensity)
- Scenario 2 (severe)
- Conclusions

NBR's role in payment systems

- The NBR's statutory task :

  "To promote and oversee the smooth operation of payment systems with a view to ensuring financial stability" (Law No. 312/2004 on the Statute of the National Bank of Romania) is fulfilled by:

  → providing payment and settlement systems for payments and securities (NBR runs ReGIS, SaFIR and PCH systems);

  → overseeing RON-denominated payment and securities settlement systems (NBR sets forth standards and assesses all national systems' compliance with these standards);

  → preserving a regulatory and supervisory payment system framework harmonized with the international standards.

ReGIS payment system main features

- ReGIS is the Romanian Real Time Gross Settlement System of payments in domestic currency (leu)
- ReGIS ensures the real-time final and irreversible settlement of large-value and time-critical payments
- ReGIS is the core national payment system, the principal domestic SIPS
- NBR's main responsibilities in its capacity as owner and business operator of ReGIS from the financial stability perspective:
  - to manage and monitor the liquidity in the system in order to avoid possible disturbances;
  - to ensure business continuity including the decision to transfer the processing to the alternative (secondary) site as a result of contingency event.

ReGIS payment system main features (cont.)

- Participants in ReGIS:
  - 42 credit institutions licensed by NBR (banks, credit unions head offices, mortgage companies);
  - the State Treasury;
  - the National Bank of Romania (NBR);
  - 8 ancillary systems:
    - SAFIR - the central depository and government securities settlement system;
    - SENT - the automated clearing house for low-value payments;
    - PCH - the system for clearing payments made via cheques, bills of exchange and promissory notes;
    - RoClear - the clearing and settlement securities system for corporate securities traded on the stock market (Bucharest Stock Exchange);
    - 2 other clearing and settlement securities systems for derivatives– (Eltrans, Clearing/settlement system and central counterpart);
    - VISA and MasterCards - the clearing systems for domestic currency card transactions.

ReGIS payment system main features (cont.)

- Transactions in ReGIS:
  - Domestic large-value (above 11.600 EUR) and time-critical interbank payments;
  - Central banks operation → monetary policy operations, foreign exchange market operations, cash operations etc.;
  - Net settlement instructions from ancillary systems (SaFIR, SENT, PCH, RoClear, VISA, MasterCard);
  - Cash-leg from DvP transactions from SaFIR and other securities settlement systems (RoClear etc.)

ReGIS payment system main features (cont.)

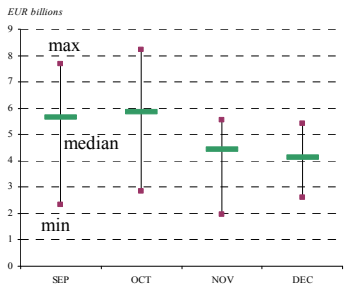
- Liquidity within ReGIS:
  - Can be managed in a flexible way;
  - Each participant may hold minimum reserves in its settlement account in ReGIS, which may be used for intraday settlement (as guaranty or as a management tool for its own liquidity);
  - Provision of intraday liquidity by the NBR (collateralized intraday credit facility) → currently intraday repo against GS and CD;
  - The main liquidity management instruments available to participants are:
    - the on-line control of information on queues and/or participants' liquidity
    - the reserves set aside in participants' accounts (reserves in settlement accounts, reserves for net position settlement from ancillary system etc.)
    - the active management of payments queue (FIFO mechanism)
    - the prioritization of payments (directly by participants or NBR)

Why financial stability cares about ReGIS payment system?

- ReGIS is a systemically important payment system → it settles transactions critical to the economy → the problems arising in ReGIS may cause problems in the whole domestic financial system
- A smooth operation of payment system facilitates transmission of central bank monetary policy to real economy
- A sound payment system insulates and absorbs financial shocks, minimizing their impact on real economy
- A smooth and safe functioning of payment system relies on a healthy financial system (at both level - institutions and markets)

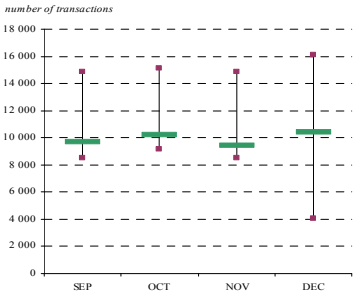
Statistics on ReGIS payment system for September – December 2008

Total value of daily payments



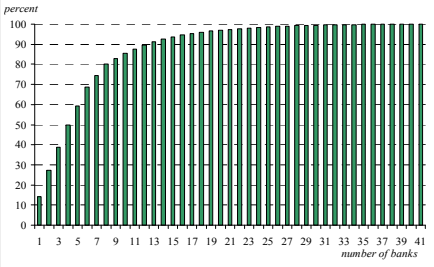
Source: National Bank of Romania

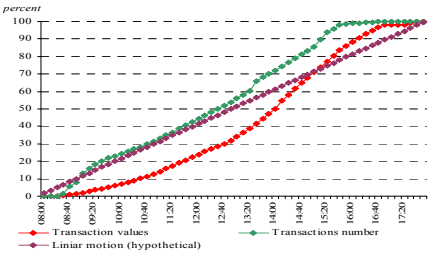
Number of daily payments



Source: National Bank of Romania

Statistics on ReGIS payment system for September – December 2008 (cont.)





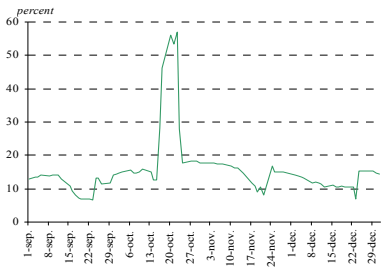
Concentration is similar to the one based on total assets

BUT not the same banks are on top

Participants behavior during the day reveals delaying of large-value payments at the end of day

Domestic financial system distressed in October 2008

ROBOR-ON (over night interest rate)
September – December 2008



Source: National Bank of Romania

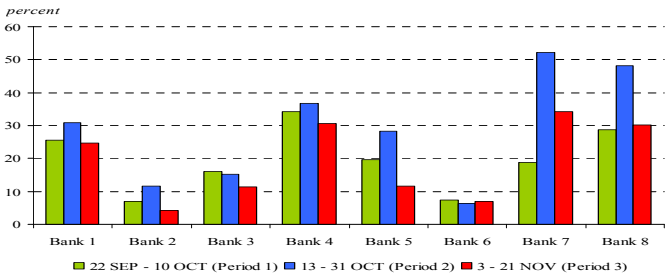
Extensions of ReGIS transitioning schedule

Date	Schedule extension
16 October 2008	5 min
17 October 2008	1h and 25 min
20 October 2008	20 min
23 October 2008	10 min
24 October 2008	5 min
31 October 2008	50 min

Source: National Bank of Romania

Domestic financial system distressed in October 2008 (cont.)

Intraday account balances volatility for the first 8 participants in ReGIS payment system



Source: National Bank of Romania

Domestic financial system distressed in October 2008 (cont.)

Relative bilateral transactions for the first 8 participants in ReGIS payment system, sorted in the first column

	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5	Bank 6	Bank 7	Bank 8
Bank 1	-							
Bank 2		-						
Bank 3			-					
Bank 4				-				
Bank 5					-			
Bank 6						-		
Bank 7							-	
Bank 8								-

Note: With green color are marked the higher values of bilateral transactions in period 2 (13 – 31 October 2008), comparing to period 1 (22 September – 10 October 2008) and period 3 (3 – 21 November 2008) and with red color are marked the lower values of bilateral transactions in period 2, comparing to periods 1 and 3

Source: National Bank of Romania

Operational risk in the payment system

Covers a lot of business areas and poses real threat to payment system stability:

- Employee errors
- Technology problems (operational errors, unauthorized use of technology)
- Hardware failure
- Security (hacking, external disruptions)
- Software (computer virus, programming bug)
- Systems (system maintenance)
- Telecommunications failure
- Natural disasters

Operational risk in the payment system (cont.)

Multiple business continuity arrangements…:

- Secondary processing site
- Contingency procedures and bilateral arrangements for performing critical functions
- Crisis management teams
- Business impact analysis
- Back- up facilities
- Possibility of central bank to submit payments into the system if one or more participants fail to access directly the IT platform

Operational risk in the payment system (cont.)

…BUT sizeable losses may arise because:

- Risks can only be mitigated, not completely removed
- Participants can behave irrational during distress events (refuse to announce the problem, get panicked)
- Business continuity arrangements may fail simultaneous
- In many cases there is no experience with extreme events (successfully tests of contingency plans can create a false image of real capacity to deal with problems)

Operational risk in the payment system (cont.)

Coordinates of our approach:

- Objective: to test the ability of ReGIS payment system to absorb liquidity shocks triggered by operational incidents
- Instruments: two scenarios (medium and severe) based on assumptions (no historical data on operational incidents)
- Data available: account balances at the beginning of the day and transactions for September – December 2008
- Tool: Simulator BoF-PSS2

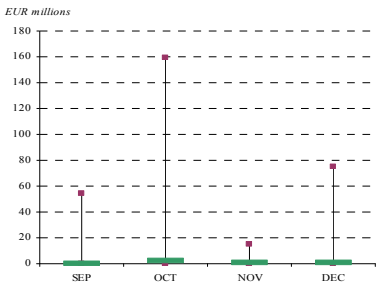
Scenario 1 (medium intensity)

Assumptions:

- A malfunction at IT platform cut the possibility of participants to feed their settlement accounts with cash from other accounts opened at central bank
- Participants can use for payments settlement only the cash available in their settlement accounts at the beginning of the day and the amounts received from other participants, during the ReGIS operating hours
- Payment orders can not be postponed for the next day

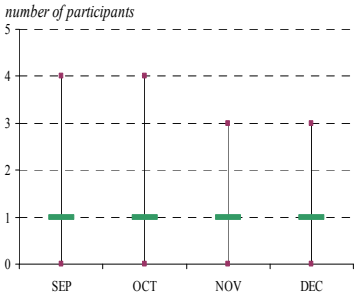
Scenario 1 (medium intensity) (cont.)

Maximum daily queues



Source: National Bank of Romania

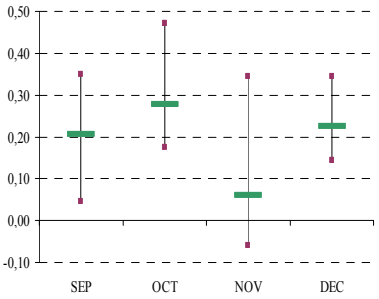
Maximum daily participants with queued payment orders



Source: National Bank of Romania

Scenario 1 (medium intensity) (cont.)

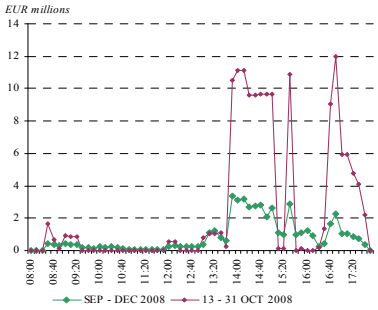
Liquidity usage indicator



Note: Liquidity usage indicator is computed by dividing liquidity used at bigining of the day account balance

Source: National Bank of Romania

Shock transmission during the day



Source: National Bank of Romania

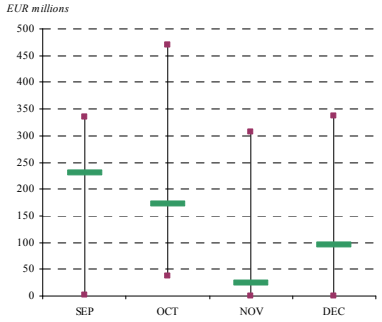
Scenario 2 (severe)

Assumptions:

- A malfunction at IT system cut the access of the most important participant in the payment system, therefore it cannot submit payments anymore
- The other participants do not observe the incident and continue to submit payments to the disrupted participant (a "liquidity sink" takes place, Glaser and Haene (2008))
- Payment orders can not be postponed for the next day

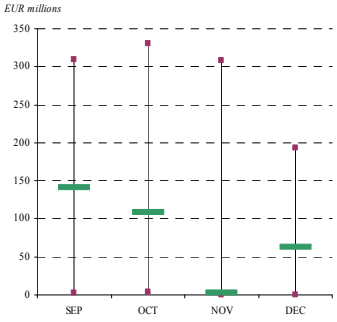
Scenario 2 (severe) (cont.)

Maximum daily queues



Source: National Bank of Romania

Daily unsettled payments

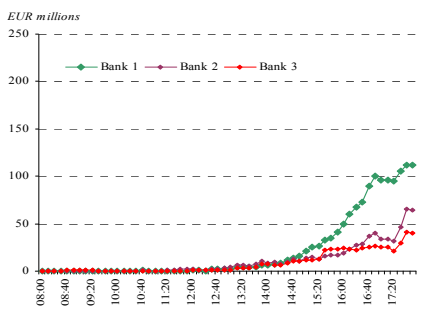


Source: National Bank of Romania

Scenario 2 (severe) (cont.)

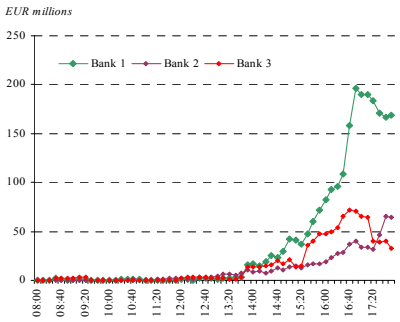
Shock transmission through payment system during the day

September – December 2008



Source: National Bank of Romania

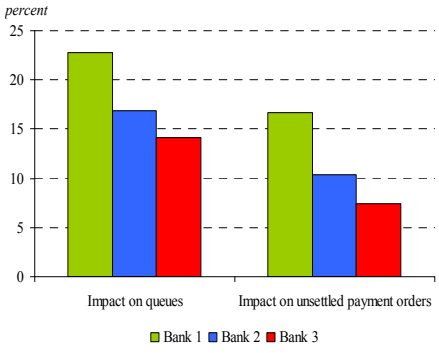
13 – 31 October 2008



Source: National Bank of Romania

Scenario 2 (severe) (cont.)

The relative impact of payments not submitted



Source: National Bank of Romania

Relative size of the impact is directly proportional to the participant share in the payment system. A severe tightening of liquidity injections into the system leads to large-value payments in queues and unsettled payments, but as the shock became less severe, the relative impact decreases significant.

Conclusions

- Global financial crisis caused imbalances in ReGIS payment system, but their intensity was low.
- The incentive to make liquidity reserves and to delay payments until receiving funds from other participants is justified by information asymmetry and cutting costs, therefore few options to change banks behavior remain.
- The improvement in participants' abilities to manage liquidity is limited by the uncertainty concerning the other participants behavior.
- The payment system has the capacity to absorb medium-sized liquidity shocks that may be generated by operational incidents.

Conclusions (cont.)

- The occurrence of a major operational incident during the second half of the day can cause a liquidity shortage into the payment system. Even if the shock is completely absorbed, participants are exposed to higher borrowing costs from money market and the interest rates may also increase.
- The system tends to an equilibrium point, where participants inject into the payment system only the liquidity necessary to meet customer needs without sending liquidity imbalance signals to other participants.

Thank you!