The liquidity impact of merging bond and equity settlement systems

Preliminary results

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Plan

- Motivation and overall objectives
- Outline analytical framework
- Preliminary results
- Conclusions

Project objectives

- **Analyse liquidity savings by capturing exclusively the impact of:**
  - Funds account structures (focus on NCSD Finland) and the market practice
  - The settlement algorithm (of equities settlement system)
- **Increase –step-by-step, our understanding of**
  - A small local market in the framework of consolidating post-trading infrastructures
  - The meaning of the Finnish market practices (eg handling of payments)
- **Support in evaluations of different system alternatives**

Outline analytical framework

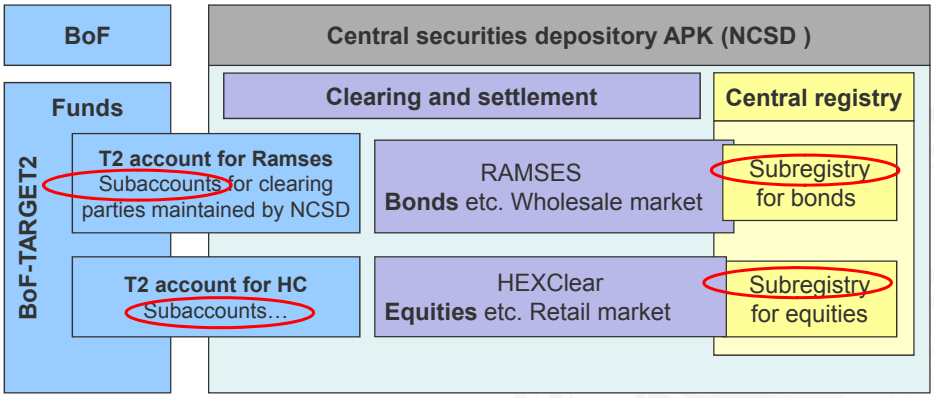
- **Research question:**
  - What is the most immediate effect (liquidity savings) of merging two SSSs (RM and OM) –> lower bound of benefits, at participant and system level?
- **This estimate is made simply by calculating the difference between the liquidity requirement for the current volume of securities transactions in the two SSSs and the simulated liquidity requirement for a corresponding volume settled in a single SSS**

Simulation methodology – what to merge?

- **Base-case (separate systems)**
  - Simulation run using historical data from equities SSS
    - Approximate description of the real-life settlement algorithm (HEXClear)

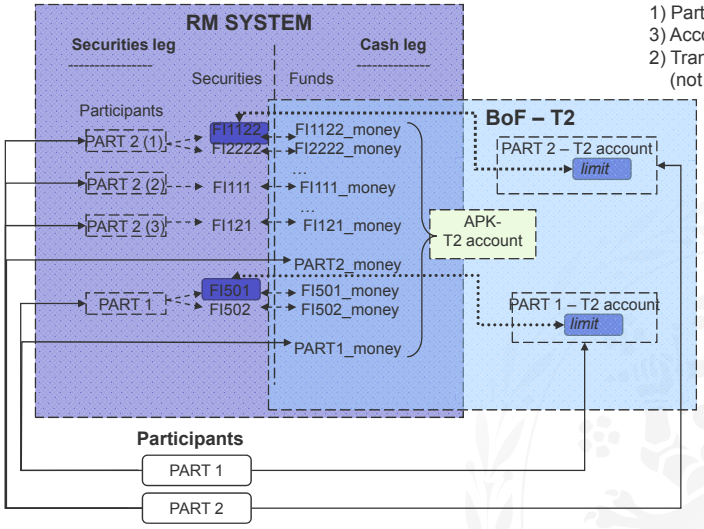
    PLUS
  - Observed liquidity usage (part level) of bonds SSS, ie, payments data (from acc) from T2 Suomen Pankki
- **Merger-case (one system)**
  - Simulation run using historical data from equities and bonds SSSs
  - Funds account structure according to equities SSS
  - Settlement algorithm replicates equities SSS (HEXClear, as the first part of the base-case)

The Finnish post-trading infrastructure – Brief overview

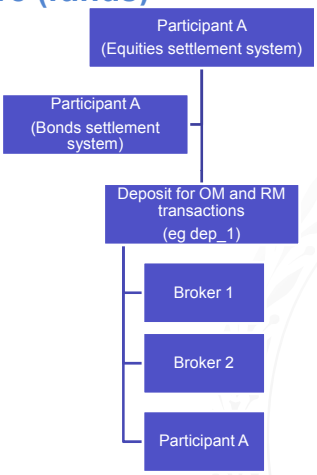


Account structure RM system – funds

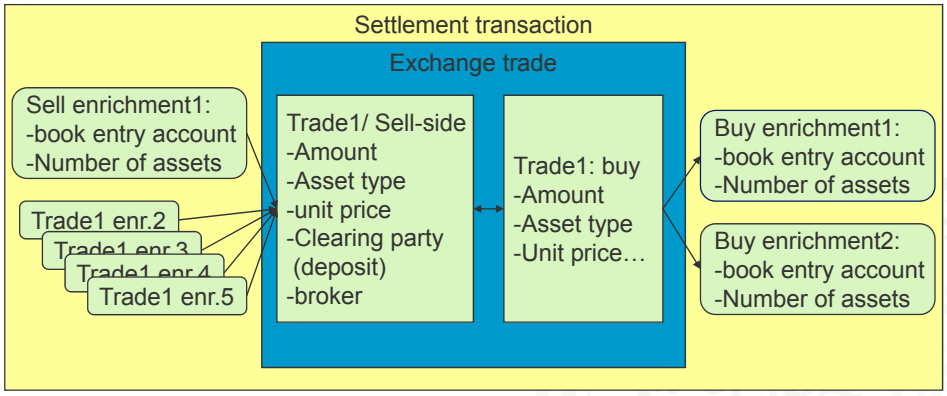
OPTIONS:
1) Participant-specific
3) Account-specific
2) Transaction-specific
(not in the picture)



Assumptions:
Account structure (funds)



Settlement transaction structure – An example



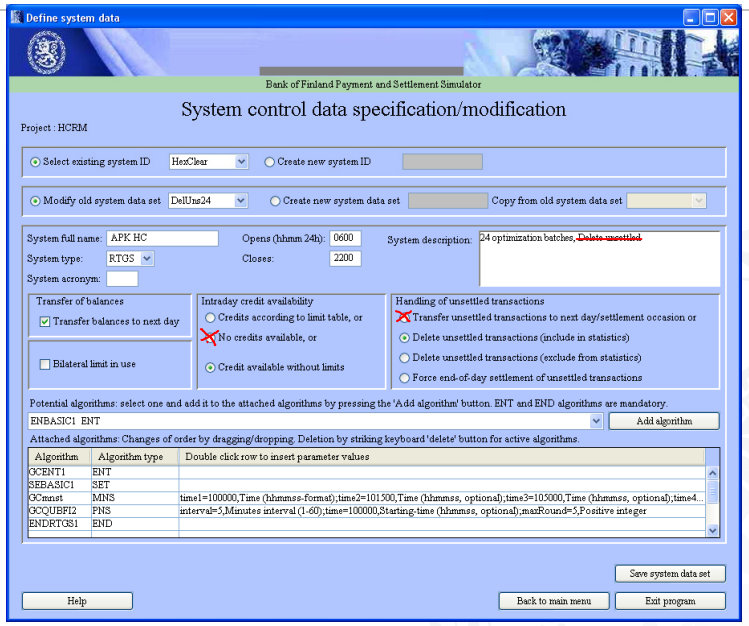
- **Simulated transactions = trade enrichments i.e. booking to individual account**
- **One trade can have arbitrary number of bookings**

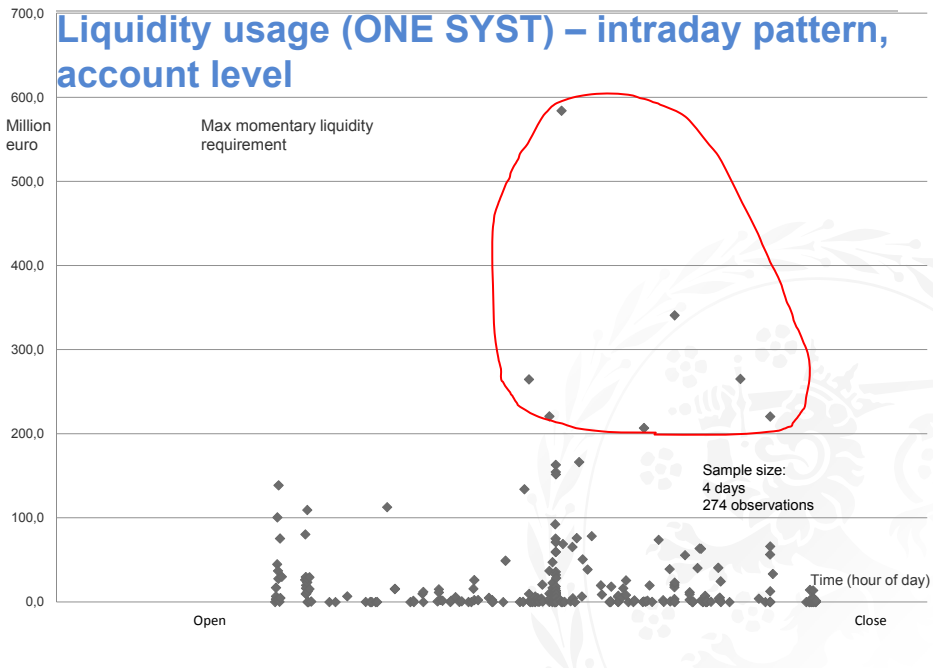
⇒ **New group code algorithms implemented through the line**

- Optimization: Batch type gridlock resolution, subset with max value (PNS)
- Greedy search alternating with asset and fund settlement

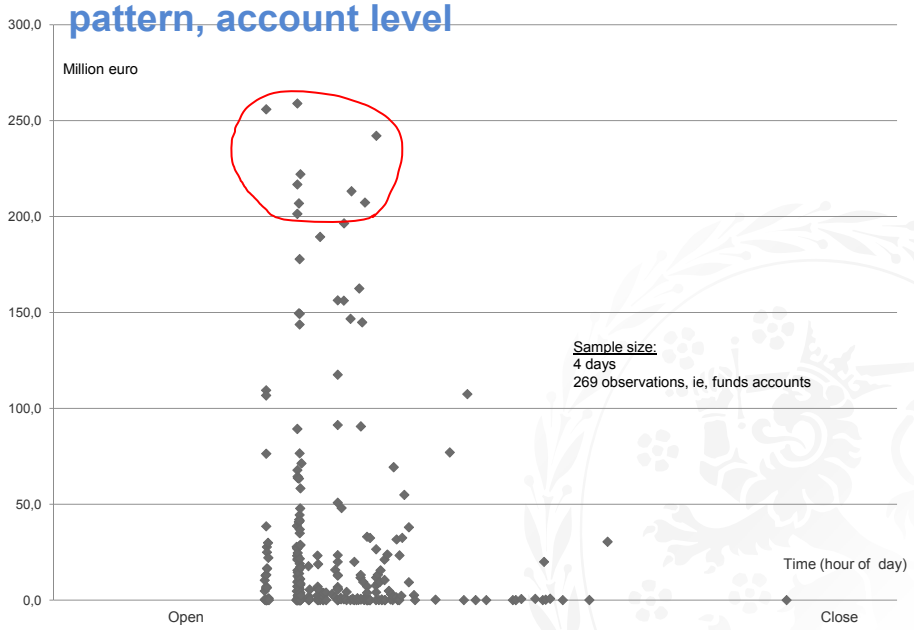
Data

- **5 days historical transaction data (April 2008)**
  - 30 active participants
  - 1 597 102 transactions (double counted)
  - 45 002 accounts
    - 90 funds accounts
- **Data set:**
  - Asset categories and transaction patterns well represented
  - High volumes, still a snapshot..

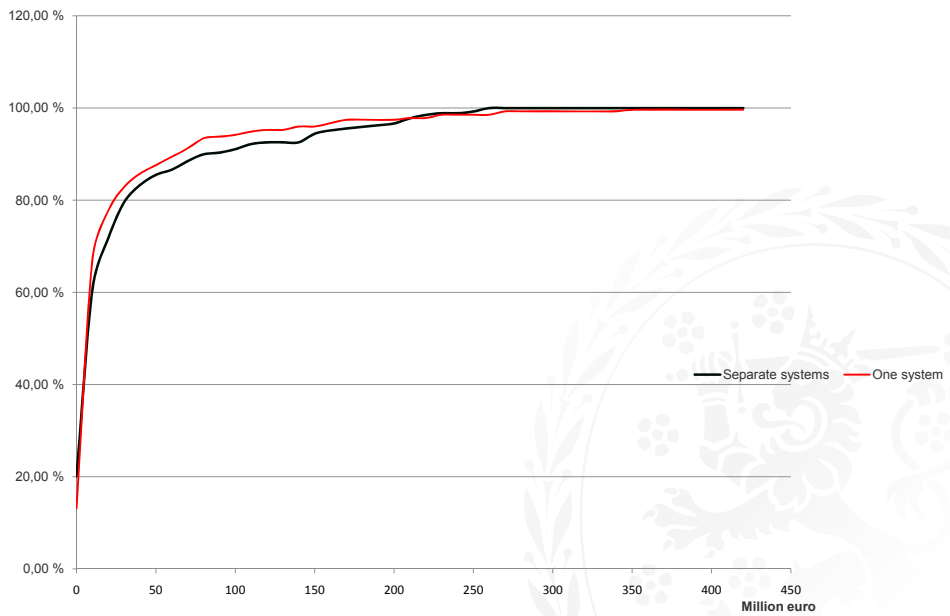

Define system data
Bank of Finland Payment and Settlement Simulator
System control data specification/modification
Project : HCRM
Select existing system ID
HexClear
Create new system ID
Modify old system data set
DelUns24
Create new system data set
Copy from old system data set
System full name:
APK HC
Opens (hhmm 24h):
0600
System description:
24 optimization batches, Delete unsettled
System type:
RTGS
Closes:
2200
System acronym:
Transfer of balances
Transfer balances to next day
Bilateral limit in use
Intraday credit availability
Credits according to limit table, or
No credits available, or
Credit available without limits
Handling of unsettled transactions
Transfer unsettled transactions to next day/settlement occasion or
Delete unsettled transactions (include in statistics)
Delete unsettled transactions (exclude from statistics)
Force end-of-day settlement of unsettled transactions
Potential algorithms: select one and add it to the attached algorithms by pressing the 'Add algorithm' button. ENT and END algorithms are mandatory.
ENBASIC1 ENT
Add algorithm
Attached algorithms: Changes of order by dragging/dropping. Deletion by striking keyboard 'delete' button for active algorithms.
Algorithm
Algorithm type
Double click row to insert parameter values
GCENT1
ENT
SEBASIC1
SET
GCmnst
MNS
time1=100000,Time (hhmmss-format);time2=101500,Time (hhmmss, optional);time3=105000,Time (hhmmss, optional);time4...
GCQUBFI2
FNS
interval=5,Minutes interval (1-60);time=100000,Starting-time (hhmmss, optional);maxRound=5,Positive integer
ENDRTGS1
END
Save system data set
Help
Back to main menu
Exit program


Liquidity usage (ONE SYST) – intraday pattern, account level
700,0
600,0
500,0
400,0
300,0
200,0
100,0
0,0
Million euro
Max momentary liquidity requirement
Sample size:
4 days
274 observations
Time (hour of day)
Open
Close

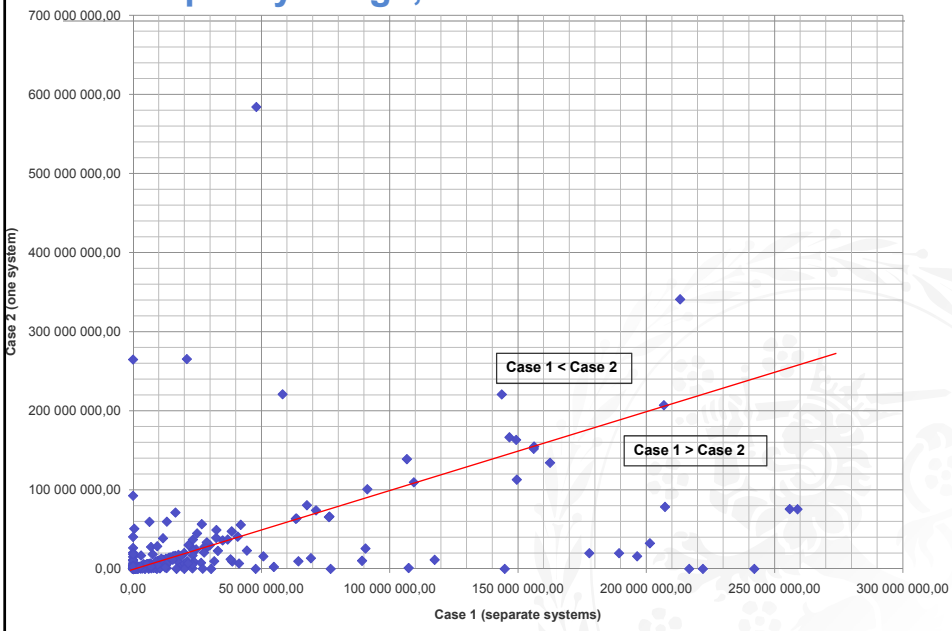
Liquidity usage (SEPARATE SYST) – intraday pattern, account level



Comparison of cases (previous slides)



Liquidity usage, deviation from 45 line



Next steps

- **System level comparisons**
  - Total aggregated momentary liquidity need
- **See example of the advanced users session 2008**
- **Sensitivity analysis**

Conclusion

- **What is the lower bound? How big is the under-estimation?**
  - Important caveat: the data set
  - Need for system level comparisons
  - NCSD intends to transfer its Swedish and Finnish transaction-processing to Euroclear's Single Platform
- **The settlement algorithm, account structure and market practices of the small local market can explain these preliminary results**
- **Other issues:**
  - Simulation approach teaches a lot of the system you study
  - You may also find quantifiable results BUT it takes some time and hard work. Especially in retail systems (with massive data) and when new processing logics are implemented in simulations.
- **Finally:**
  - much more simulations will be needed for reliable observations.