Advanced users workshop

Bank of Finland payment and settlement
simulation seminar,
Pre seminar workshops
25 August 2008, Matti Hellqvist

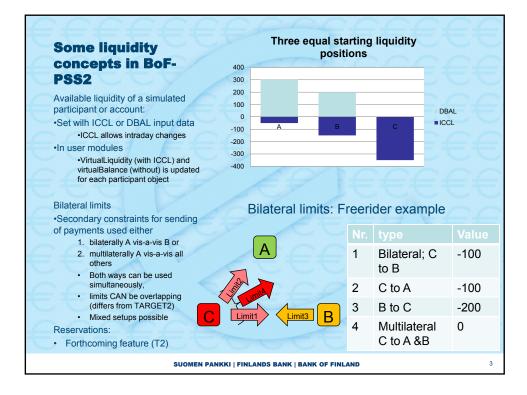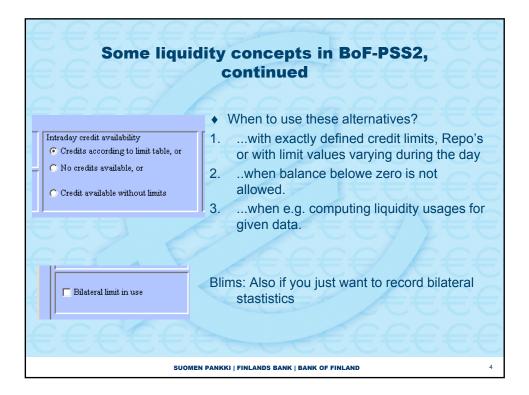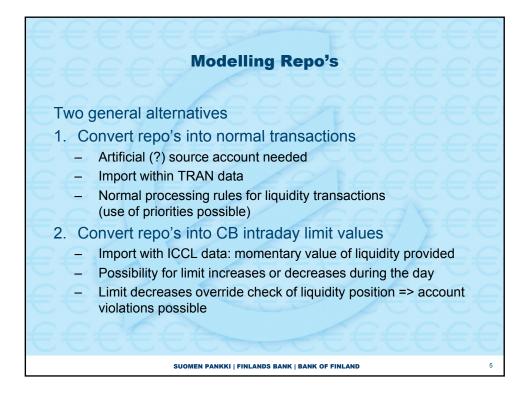SUOMEN PANKKI | FINLANDS BANK | BANK OF FINLAND

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On the agenda

1. Available liquidity concepts
   – Different ways of presenting liquidity and limits in BoF-PSS2
   – How to describe Repo's
   – Multi system setups and injections
2. Simulation management: script and DB tools
   – Command line interface, basic use
   – Command line interface and Matlab-integration (Demo)
     • a script for batch of simulations with different liquidity levels
   – Direct use of output DB (demo with MySQL Query browser or Access)
     • Calculation of selected indicators for arbitrary number of simulations
3. Addtional modelling questions
   – Securities settlement systems
   – User modules with NetBeans, set-up and debugging (Demo)
     • Case of SSS with interface to RTGS (triggering of liquidity injections)
♦ More detailled **demo material will be placed in the BoF-PSS2 extranet**.
   Tutorials section in the extranet includes also other examples

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Some liquidity concepts in BoF-PSS2

Available liquidity of a simulated participant or account:
•Set wilh ICCL or DBAL input data
  •ICCL allows intraday changes
•In user modules
  •VirtualLiquidity (with ICCL) and virtualBalance (without) is updated for each participant object

Bilateral limits
•Secondary constraints for sending of payments used either
  1. bilaterally A vis-a-vis B or
  2. multilaterally A vis-a-vis all others
  • Both ways can be used simultaneously,
  • limits CAN be overlapping (differs from TARGET2)
  • Mixed setups possible
Reservations:
• Forthcoming feature (T2)

Three equal starting liquidity positions

Bilateral limits: Freerider example

Nr.	type	Value
1	Bilateral; C to B	-100
2	C to A	-100
3	B to C	-200
4	Multilateral C to A &B	0

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Some liquidity concepts in BoF-PSS2, continued

Intraday credit availability
- Credits according to limit table, or
- No credits available, or
- Credit available without limits

☐ Bilateral limit in use

♦ When to use these alternatives?

1. ...with exactly defined credit limits, Repo's or with limit values varying during the day
2. ..when balance belowe zero is not allowed.
3. ...when e.g. computing liquidity usages for given data.

Blims: Also if you just want to record bilateral stastistics

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Modelling Repo's

Two general alternatives

1. Convert repo's into normal transactions
   – Artificial (?) source account needed
   – Import within TRAN data
   – Normal processing rules for liquidity transactions (use of priorities possible)

2. Convert repo's into CB intraday limit values
   – Import with ICCL data: momentary value of liquidity provided
   – Possibility for limit increases or decreases during the day
   – Limit decreases override check of liquidity position => account violations possible

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Multi system setups

♦ Simulations can include multiple interlinked systems
   – Each systems can have own setup: RTGS, (ancillary) DNS, SSS with DVP...
   – Transactions between systems
     • Use "to system" field of transaction data (not the From system...)
♦ Injections
   – Automatic liquidity bridges between accounts (in the same or other system), Allowed source of liquidity is set in PART input
   – Injections are initiated (currently) only at the entry
     • see the usermodule example Advanced users session in seminar 2007 for how to overcome the restriction
   – Aggregation of liquidity needs from multiple accounts into one
   – Allows modelling of interfaced SSS-RTGS relationship

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Simulation management tools

♦ Command line interface (CLI)
– Included since version 2.4.0 beta
– Automation of repetitive tasks, large batch runs or integration of BoF-PSS2 to other softwares
♦ Database utilities
– Link the simulator output directly to preferred analysis software:
• Access, SAS, Matlab, Stata, ... (MySQL ODBC link or direct database connection)
– Direct queries to database
– Housekeeping (manage templates, projects, ...)

Additional modelling alternatives

♦ SSS-systems, multi currency systems
– Arbitrary number of asset types can be included as book entry currencies
– See the documentation for which algorithms are DVP compatible
– Normal DVP/PVP:
• four involved accounts
• Two transactions tied together with linkcode in transaction data
– Generalized case
• Arbitrary number of debit or credit bookings linked
• Group code algorithms

User modules

♦ Current software structure:
  – Source code of all included algorithms is open
    • C:\bof-pss2\modules
  – User interface and simulator "core" (data structures and DB connection) are closed source
  – Simulator Javadoc is available in home pages
  – Developments are likely to be seen in this side during 2008-2009
♦ How to set up a project for own user module
  – See workshop 2007 material in extranet (step by step example) and "Algorithm description..." documentation

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