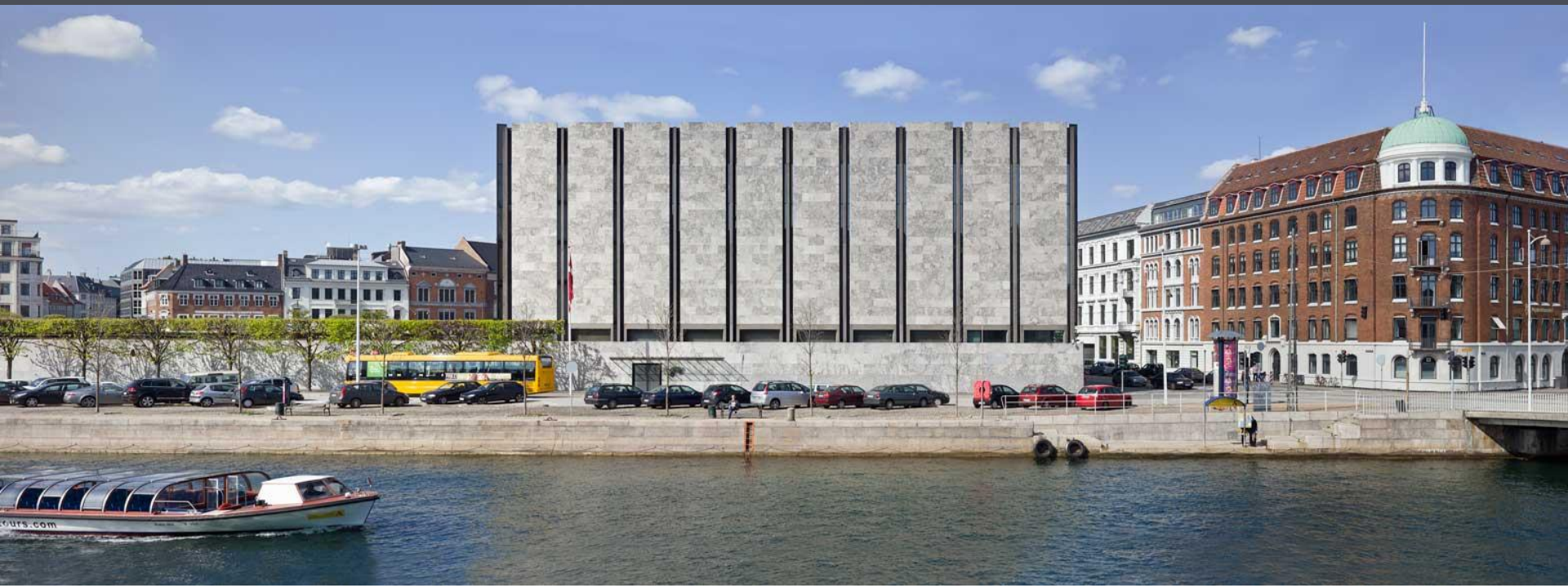
DANMARKS
NATIONALBANK

INTRADAY LIQUIDITY MANAGEMENT AND SYSTEMIC RISK IN THE DANISH INTERBANK MARKET

30. August 2013, Helsinki, Finland



DANMARKS
NATIONALBANK

Søren Truels Nielsen
stn@nationalbanken.dk

Agenda

- Background
- Objectives
- Intraday liquidity management
- Endogenous reactions
- The Danish interbank market
- Simulation results
- Conclusions

Objectives

- To simulate the Danish interbank market introducing various shocks.

- To model how participants react to these shocks allowing for endogenous responses to changed market conditions.

Intraday liquidity management

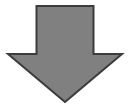
Conditions

- Banks have a number of payments during the day
- Banks seek to maximize their profit
- Intraday credit is costly (priced or collateralized)
- Postponing payments may have reputational consequences

Intraday liquidity management

Bech & Garratt (2003):

- Two banks and two periods (morning and afternoon)
- Paying early is costly in terms of intraday credit
- Paying late is costly in terms of reputational consequences



- The result depends on the relative size of the costs.
- Social optimum is not always equilibrium.
- Coordinating payments is always favorable.

Endogenous response

Concept

- Banks worry about their own liquidity situation
- Can only control own payments
- May switch between two scenarios:
  - "Normal" and "Cautious"
- When cautious, banks only pay out a percentage of what their receive – they hoard liquidity
- When satisfied with their own liquidity situation they switch back to normal.

Endogenous response

The reaction function

- Every bank start the day acting “normal”
- If a bank spend more than 30 pct. of their intraday credit they become cautious
- When cautious banks pay out only 20 pct. of what they receive
- If a cautious bank manages to produce a positive balance on their current account they switch back to normal
- May switch back and forth during the day

The Danish interbank market

- Daily turnover in Kronos: 217 billion DKK, 4,300 payments
- Very concentrated
  - Five largest participants constitute almost 90 % of the activity
- Most payments settled before noon
- Appears very coordinated
  - Spike around 9:30
- Ample liquidity
- Low intraday credit use

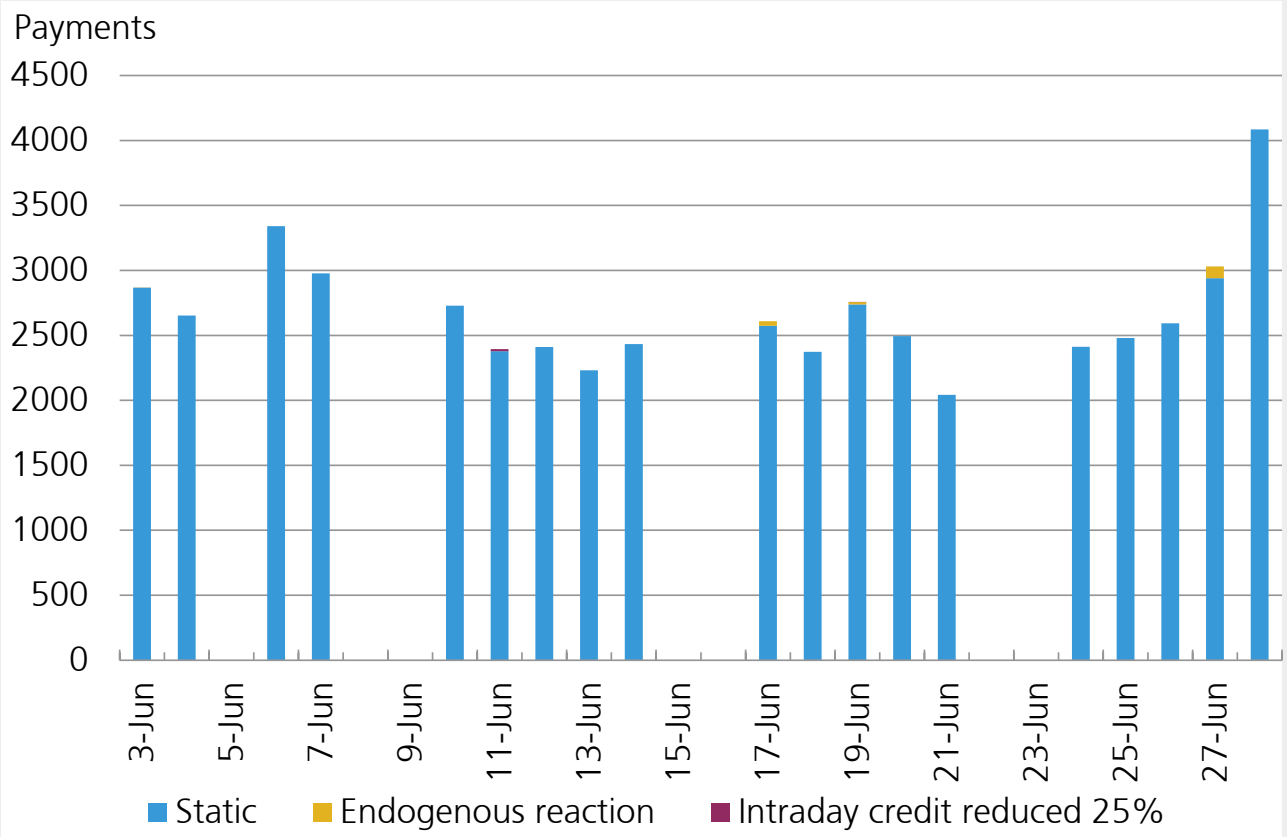
Simulation results

Setup

- Data from June 2013
- Closed system of 20 largest participants
- Three scenarios
  - Default of largest participant
  - Liquidity dry-up of largest participant
  - Precautionary demand (group of banks act cautiously)
- Static and dynamic simulation for comparison

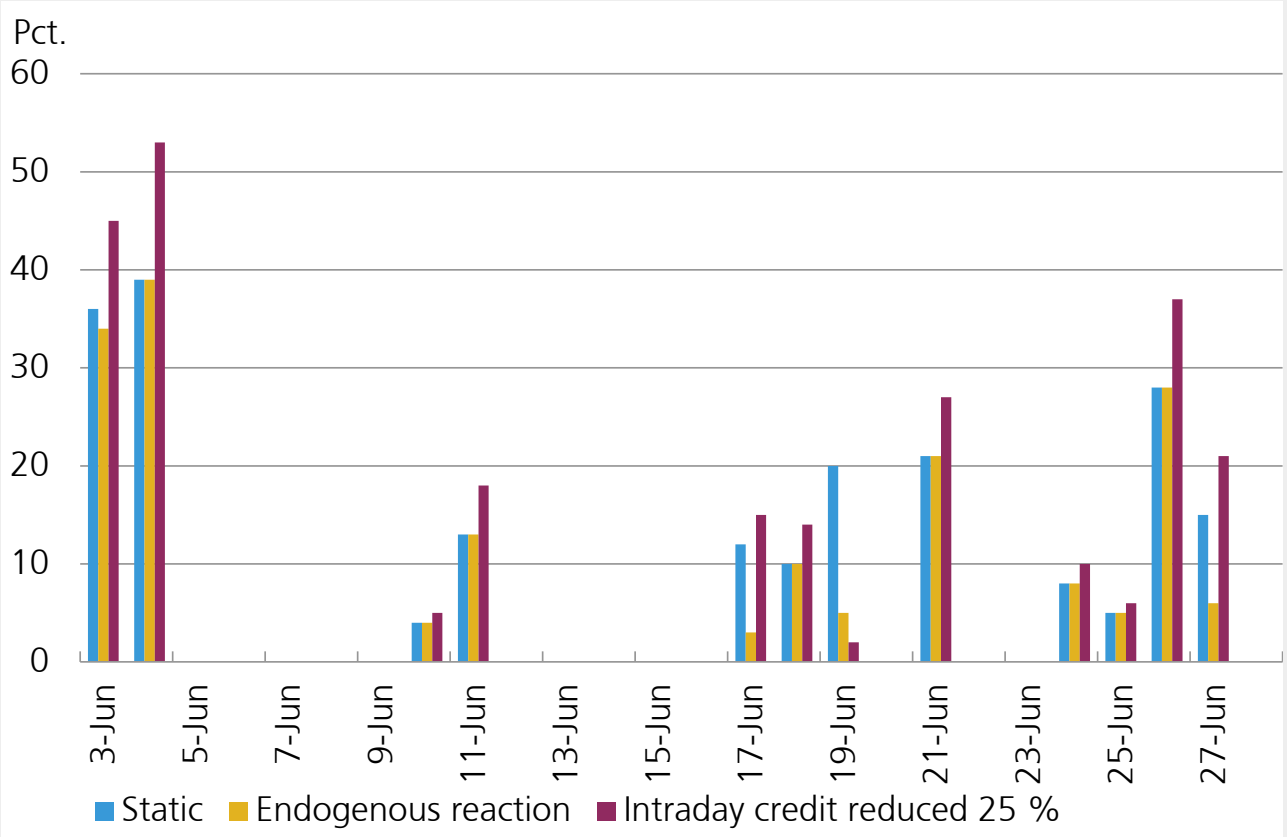
Simulation results
Default of largest participant

Cancelled payments at end of day



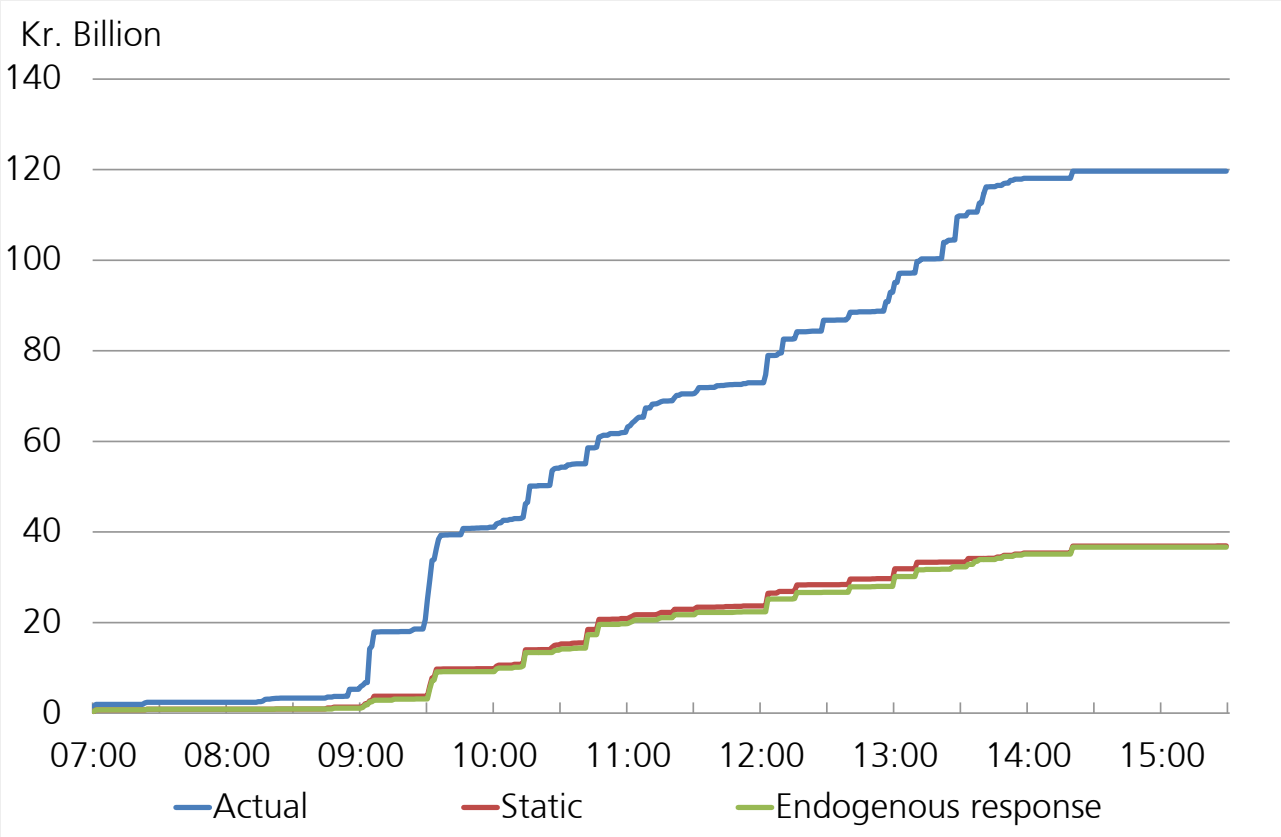
Simulation results
Default of largest participant

Maximum credit position at end of day



Simulation results
Default of largest participant

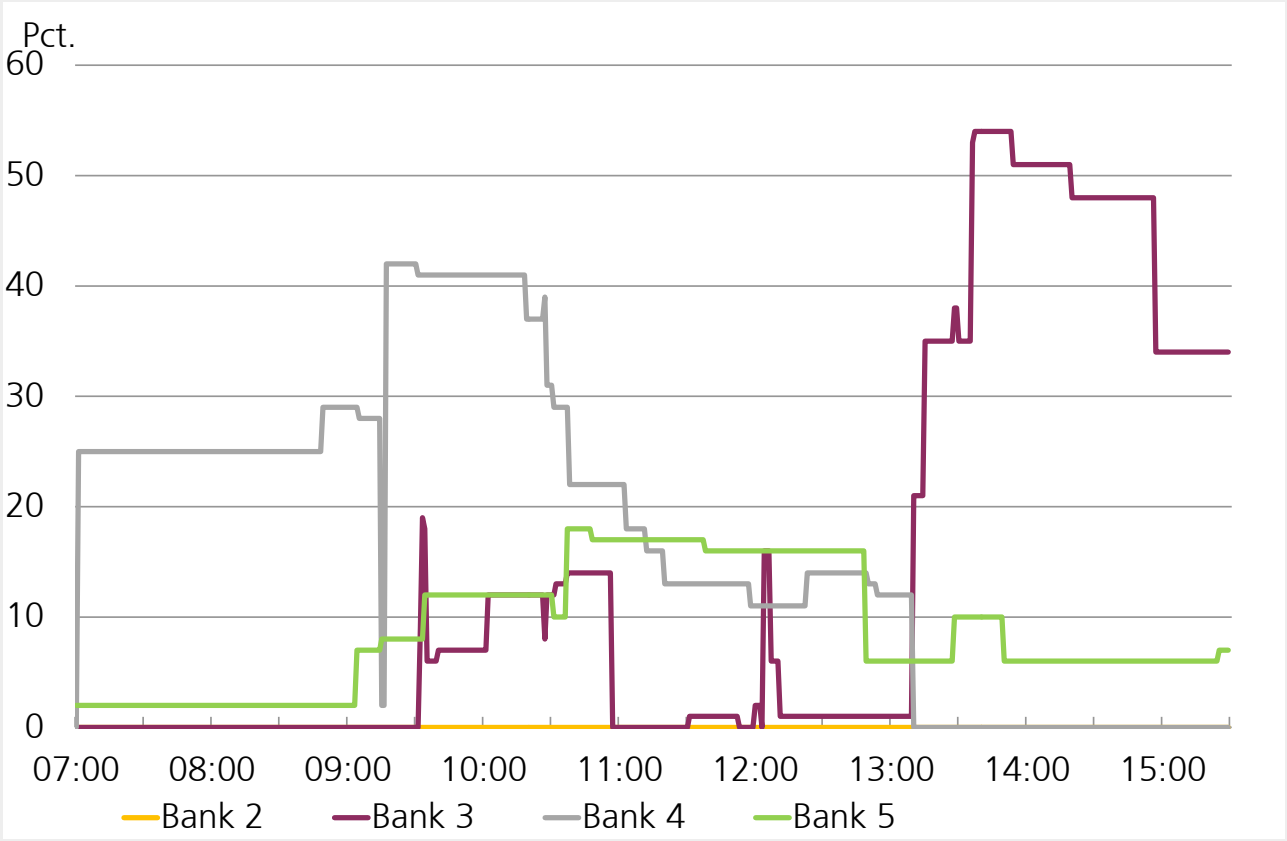
Completed payments



Note: Specific day during the period.

Simulation results
Default of largest participant

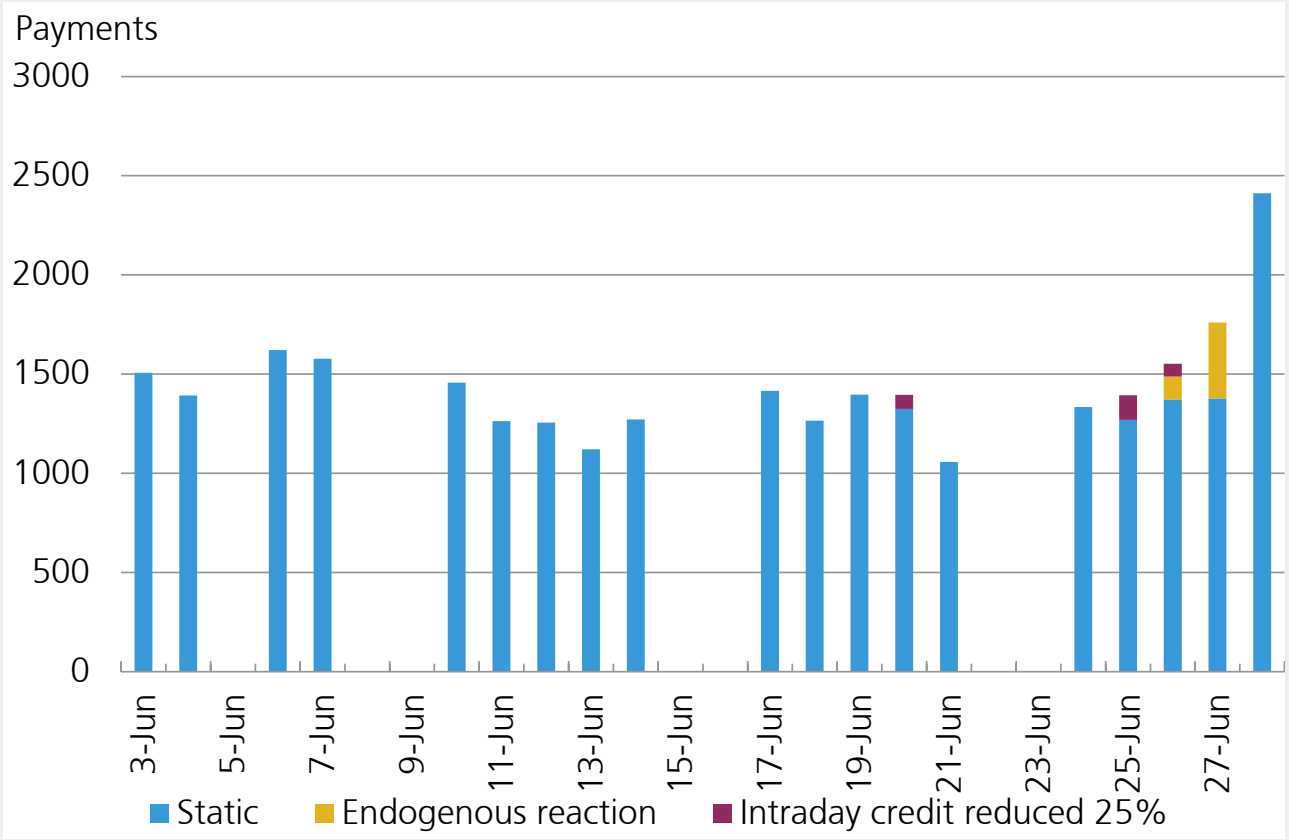
Use of intraday credit



Note: Specific day during the period.

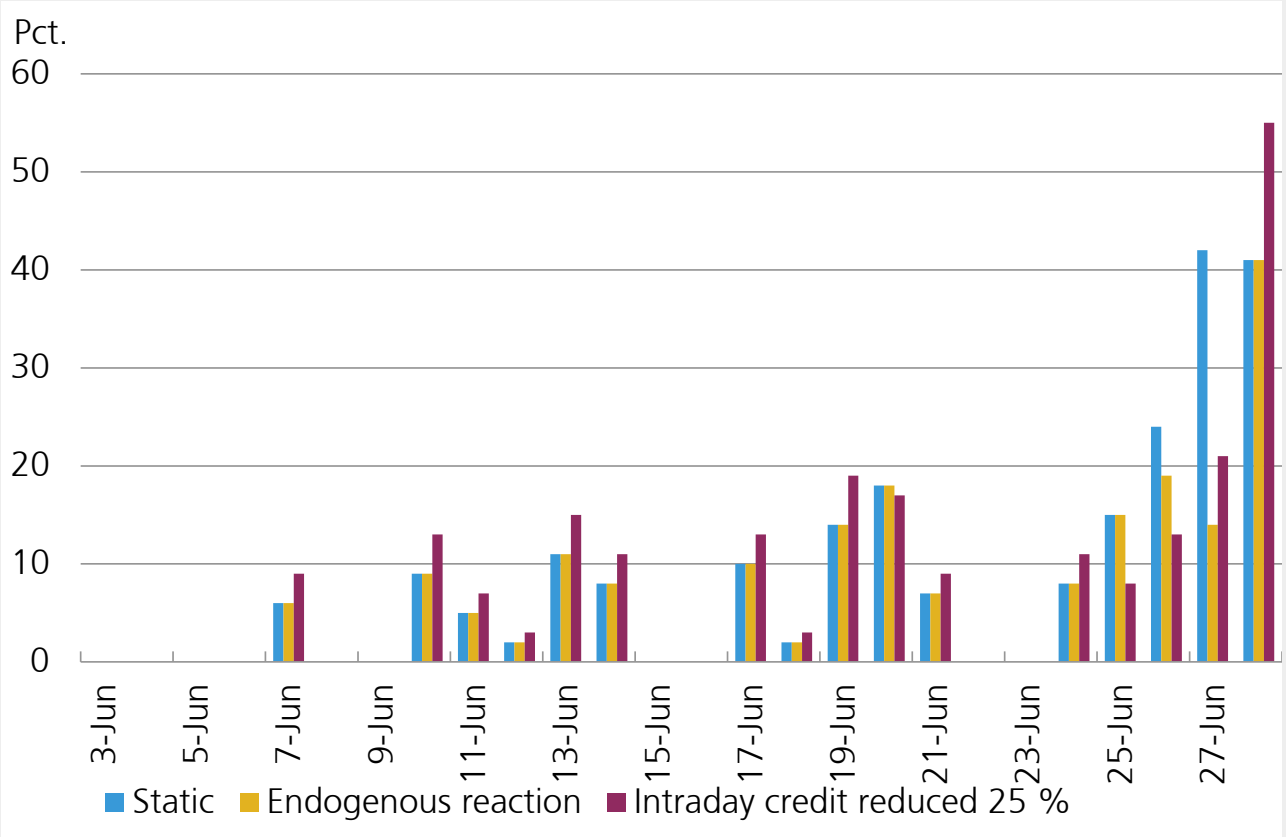
Simulation results
Liquidity dry-up of largest participant

Cancelled payments at end of day



Simulation results
Liquidity dry-up of largest participant

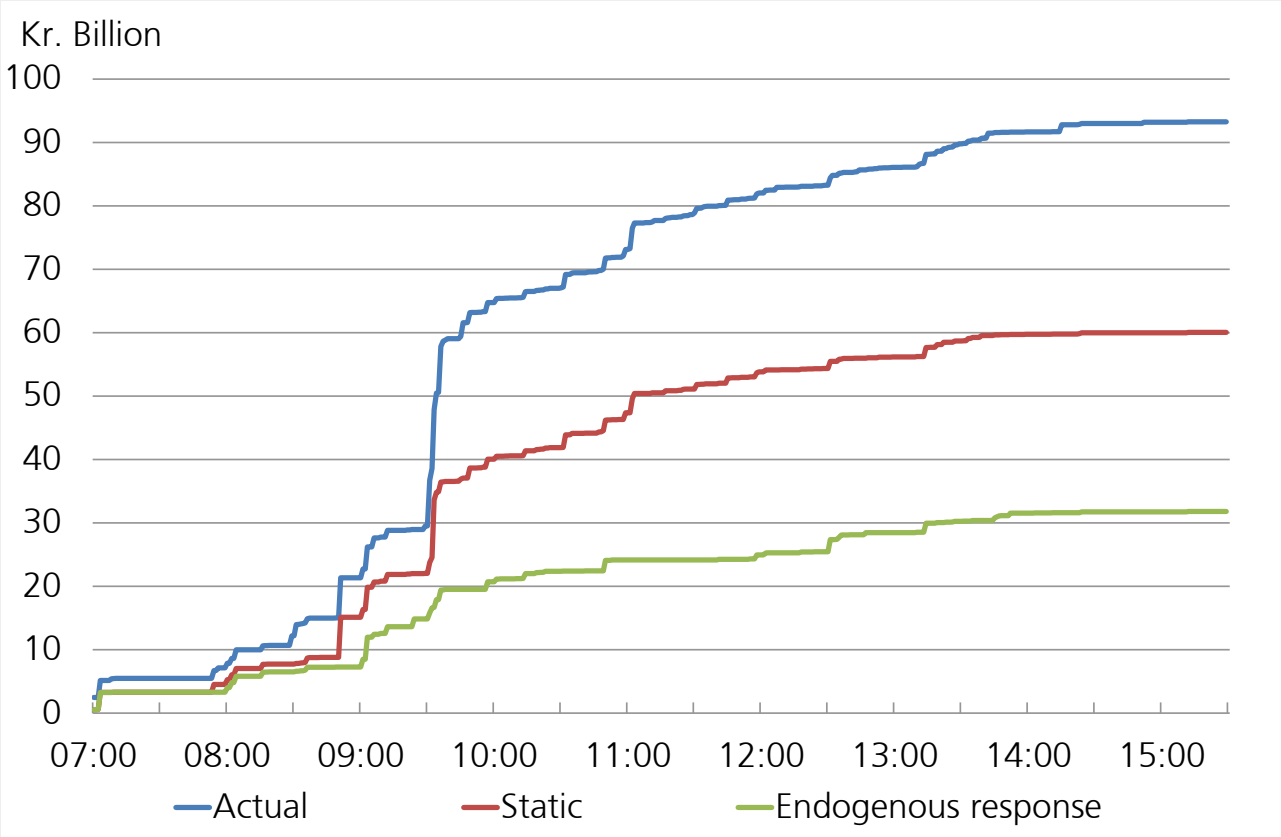
Maximum credit position at end of day



DANMARKS NATIONALBANK

Simulation results
Liquidity dry-up of largest participant

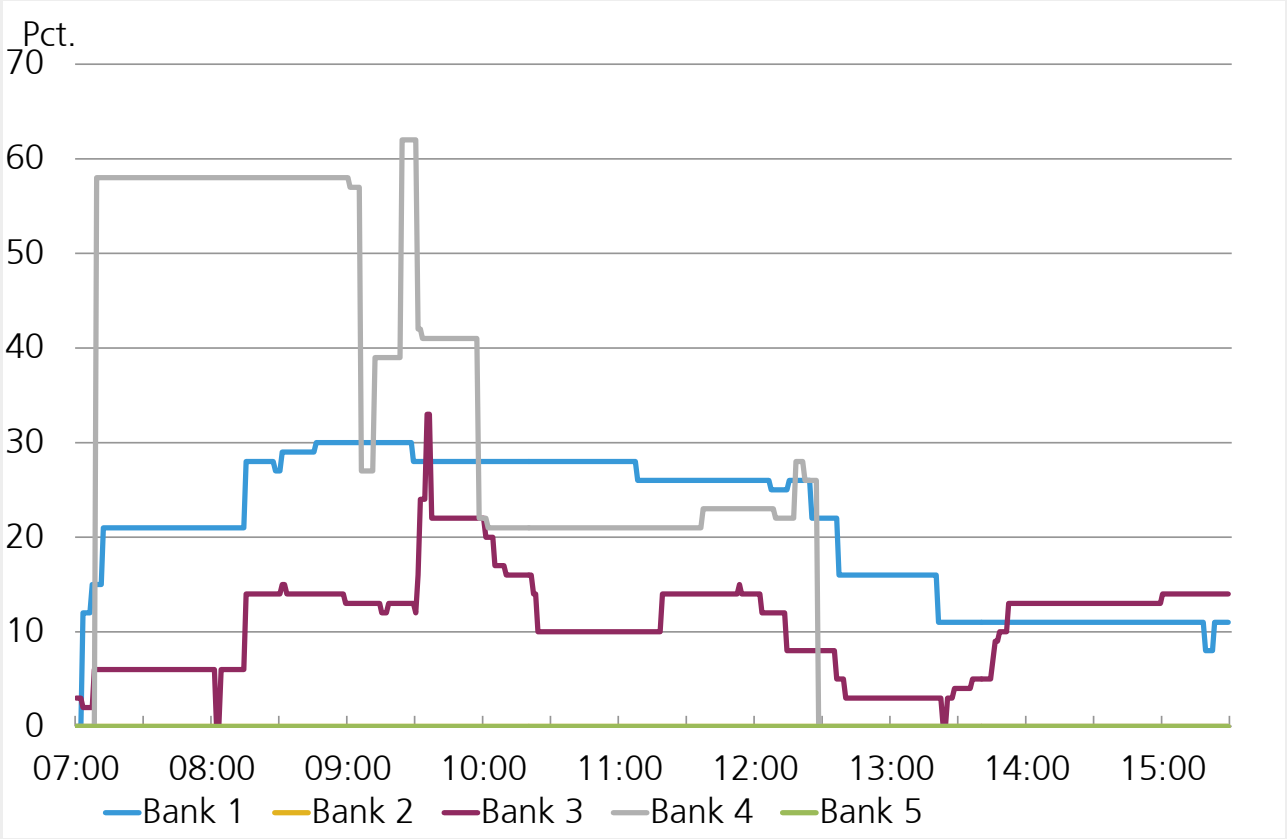
Completed payments



Note: Specific day during the period.

Simulation results
Liquidity dry-up of largest participant

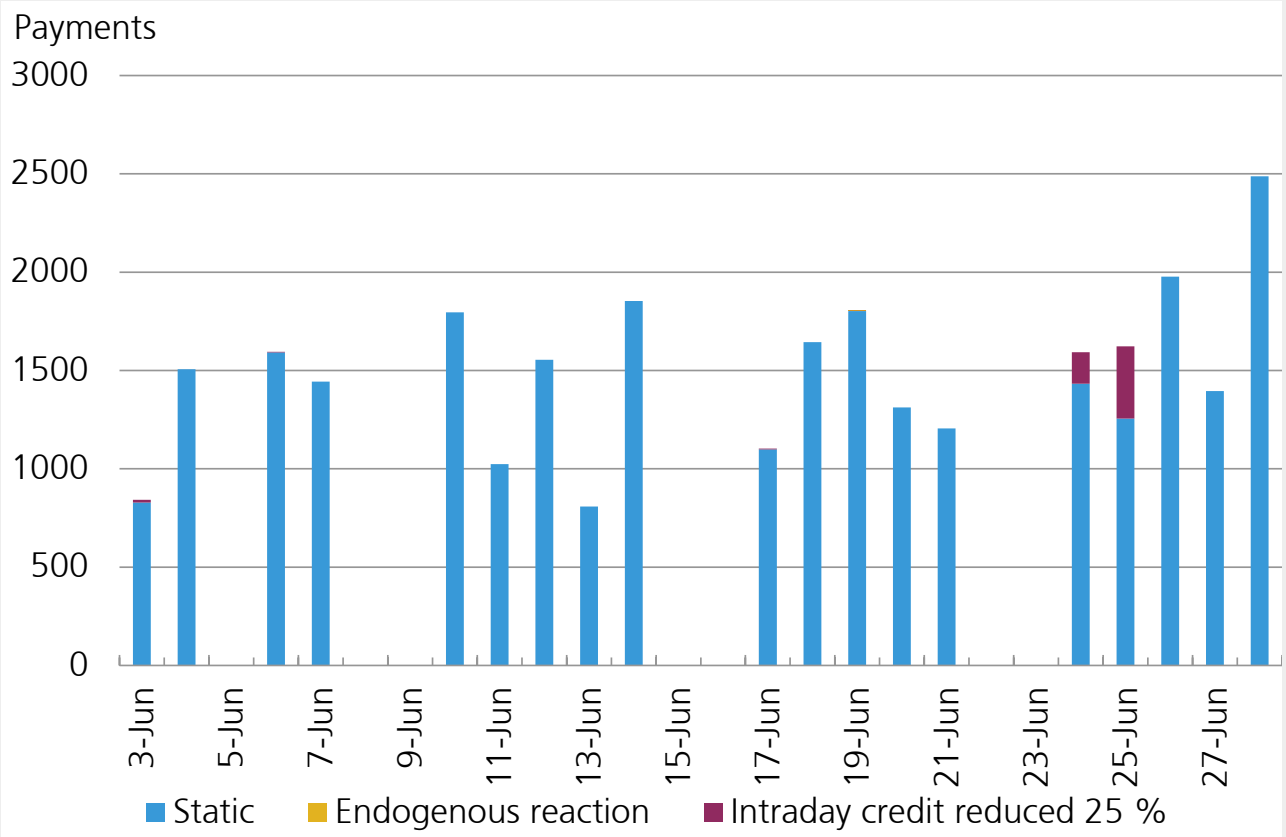
Use of intraday credit



Note: Specific day during the period.

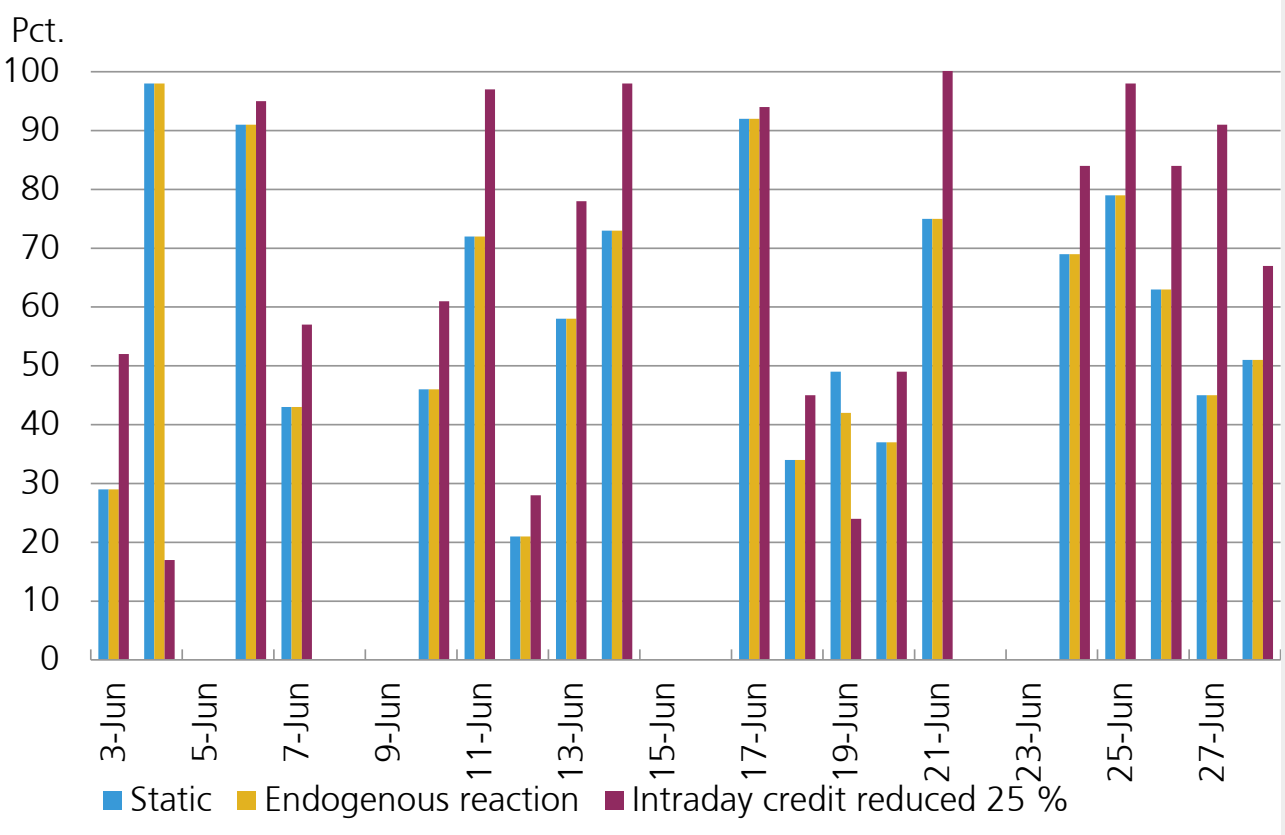
Simulation results
Precautionary demand

Cancelled payments at end of day



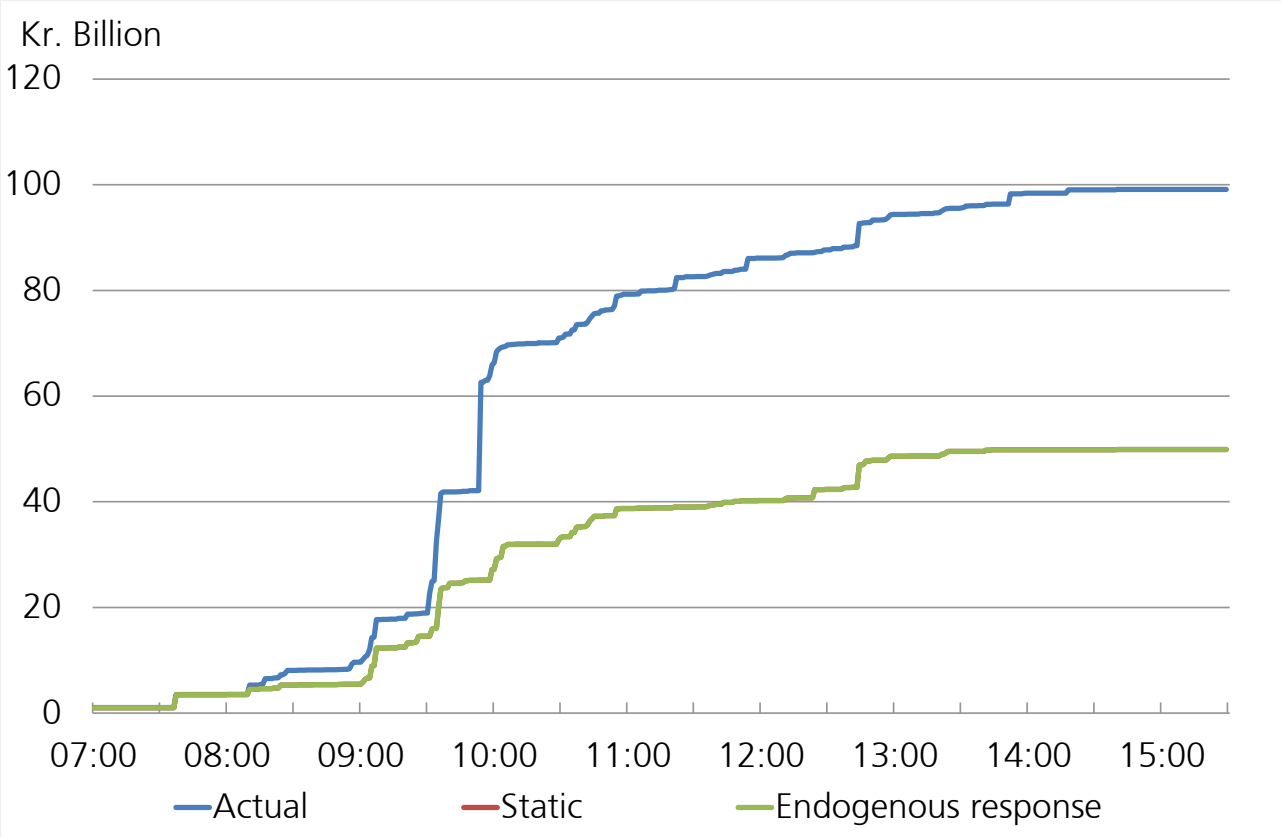
Simulation results
Precautionary demand

Maximum credit position at end of day



Simulation results
Precautionary demand

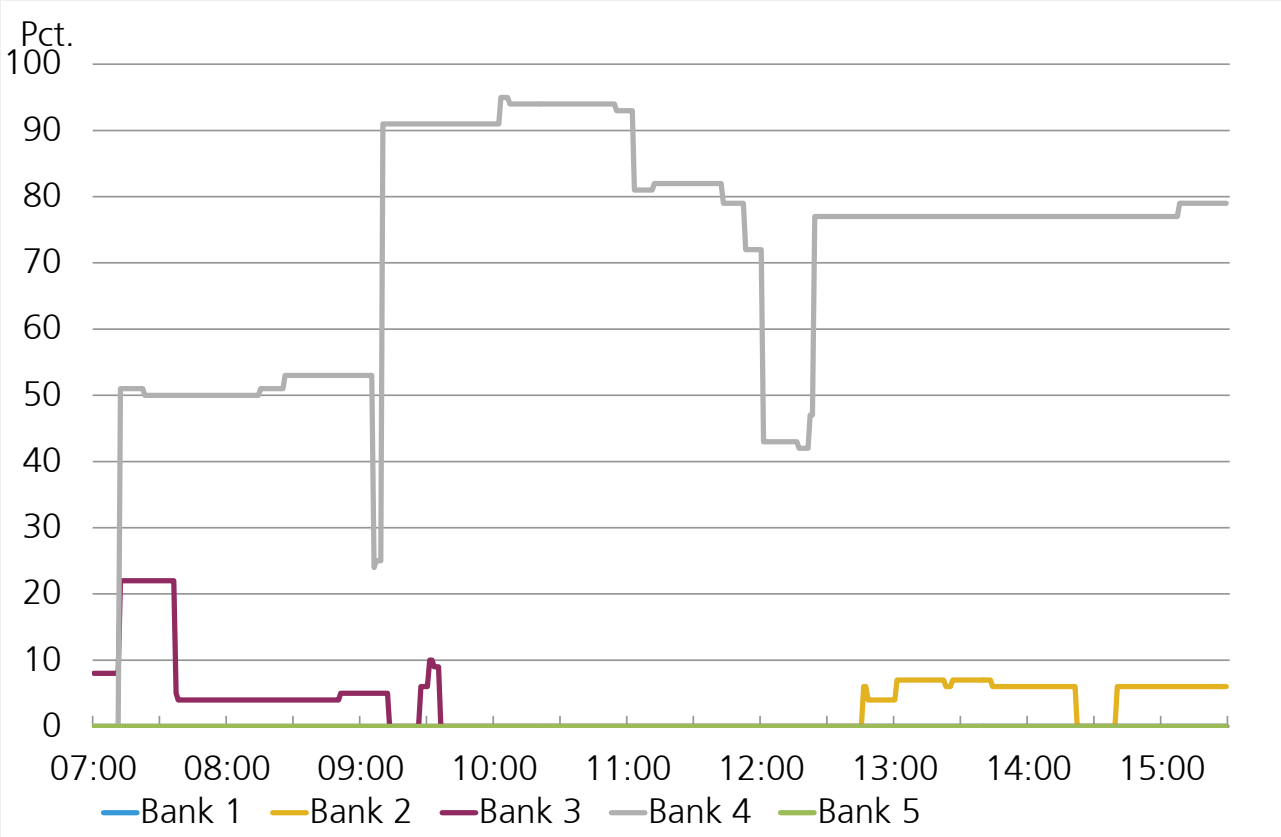
Completed payments



Note: Specific day during the period.

Simulation results
Precautionary demand

Use of intraday credit



Note: Specific day during the period.

Conclusions

- Systemic risk is low at the moment
- When liquidity is ample the banks' reactions become less important
- A lot of cancelled payments in every scenario – this is a concern in itself
- These are isolated experiments – what happens the day after?

Conclusions

The endogenous response

- Can make a bad situation worse
- Very crude – lots of assumptions!
- Has potential
- Needs more empirical evidence to support the specifics

The end

Thanks for listening!