

Monitoring money market using TARGET2-NL payments data

Payment and Settlement System
Simulation Seminar

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Ronald Heijmans, Richard Heuver, Daniëlle Walraven

“I want my money back.”

Statement of Margaret Thatcher at a press conference when she was trying to renegotiate Britain's EEC budget contribution at the EEC summit in Dublin (30 November 1979).

Outline

- Introduction
- Research questions
- Predictions
- “Furfine algorithm”
- Results and Monitoring
- Conclusions

Introduction

- Interbank market had sever problems in Q4 2008.
- Many banks had temporary liquidity (temporary) shortages.
- Banks are very reluctant to lend money.
- Interventions of central banks kept markets liquid: But the market still does not function properly!



Research questions

- How did the interbank market develop during the current crisis?
- How can the interbank market be modeled and/or monitored?
- Essential is answering this question:
How can interbank loans be identified in TARGET2 database?

Furfine algorithm

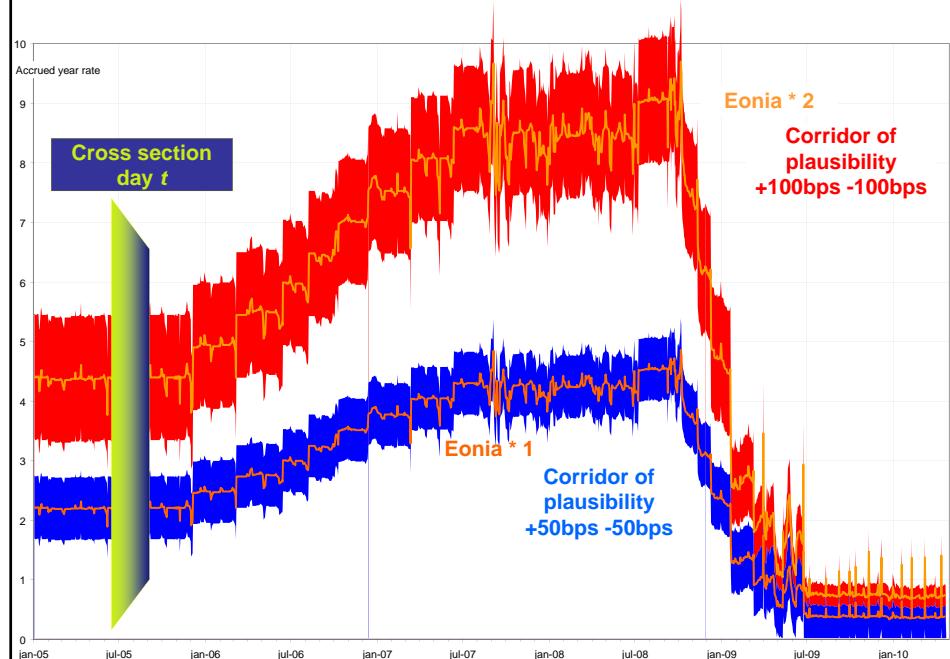
- Method first applied by Craig Furfine, 1999, BIS / Fed
 - Payment of loan on day t
 - From participant A to B
 - Value X
 - Repayments on day $t+1, t+2, t+3, \dots$
 - From participant B to A
 - Value X
plus
plausible year-interest- rate

Some calculation examples of accrued interest

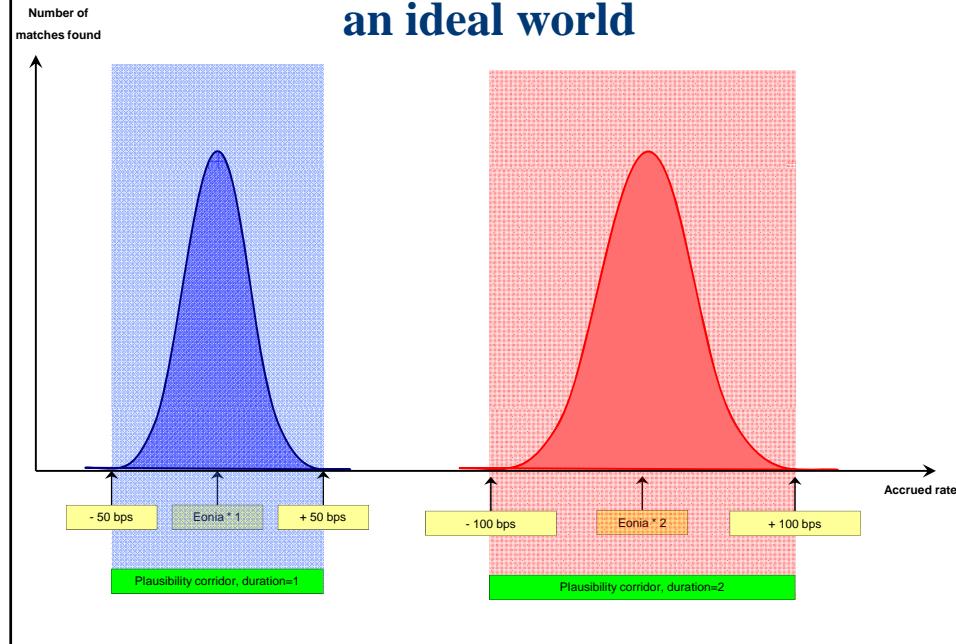
Loan amount	200,000.00	20,000,000.00	1,000,000,000.00
Rate	3.97%	3.00%	0.15%
Interest amount (year)	7,940.00	600,000.00	1,500,000.00
Duration (nr days of loan)	360	360	360
Number of days per year	360	360	360
Accrued interest amount	22.06	1,666.67	12,500.00
Refund (loan + interest)	200,022.06	20,001,666.67	1,000,012,500.00

Not visible in Payment transactions

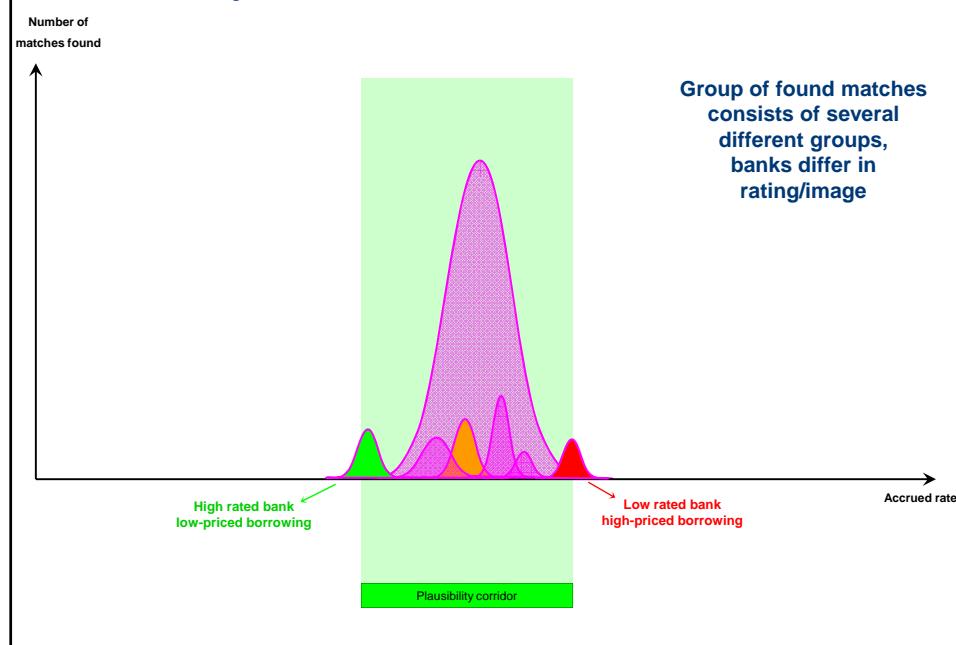
Areas of plausibility of rate ...



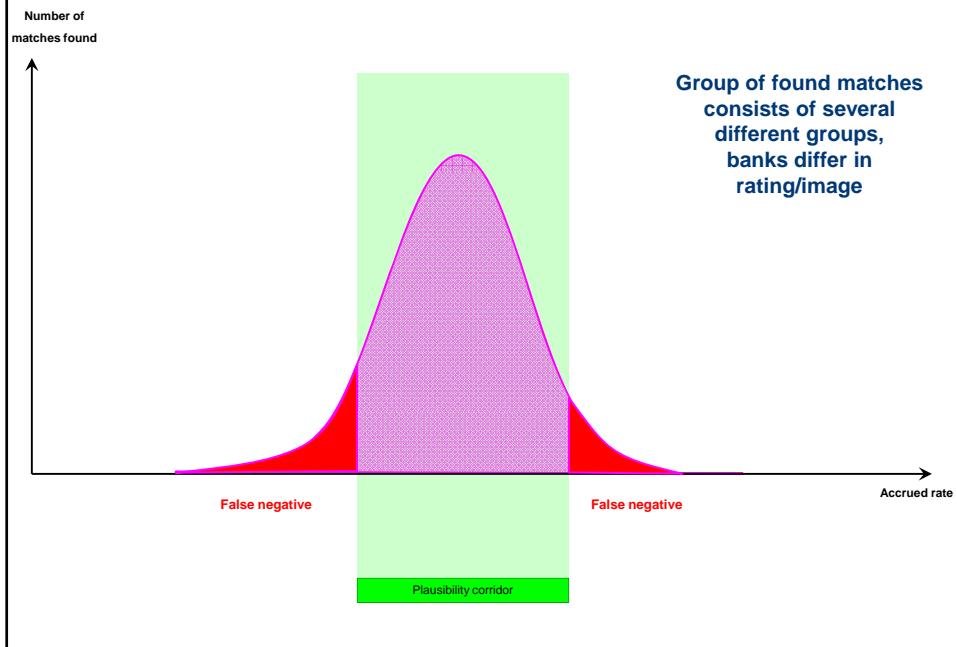
Cross-section day t - Plausibility of rate . . . in an ideal world



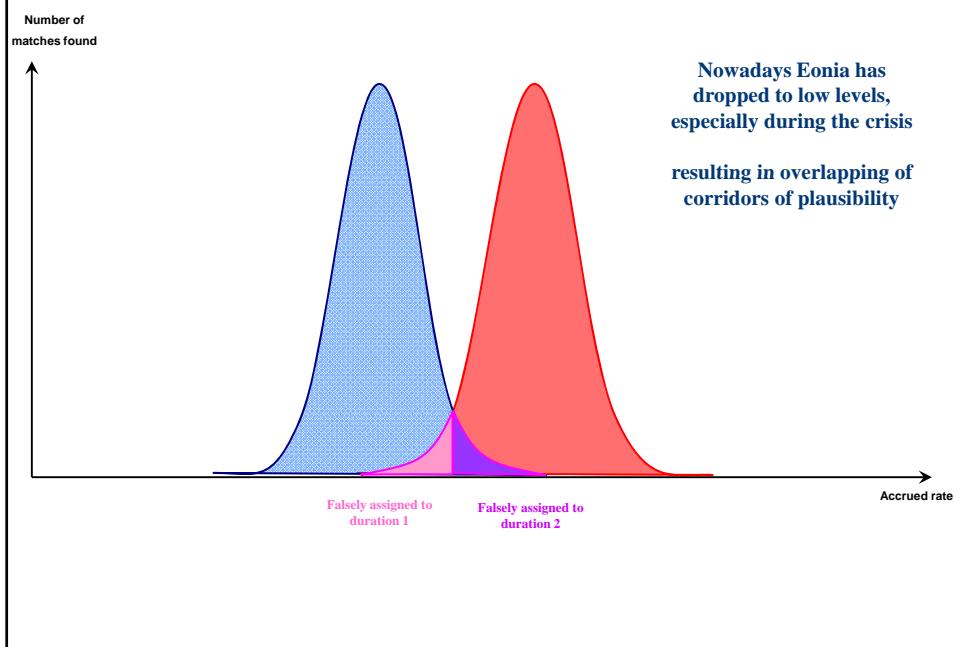
Plausibility of rate . . . in a less ideal world (1)



Plausibility of rate . . . in a less ideal world (2)

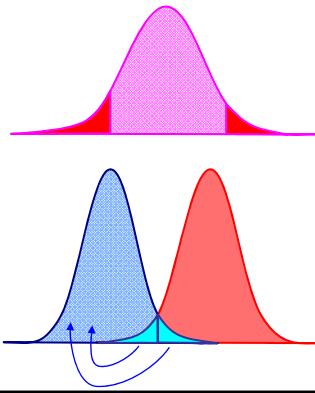


Plausibility of rate . . . in a less ideal world (3)



Assumptions/challenges in current version v02.06a

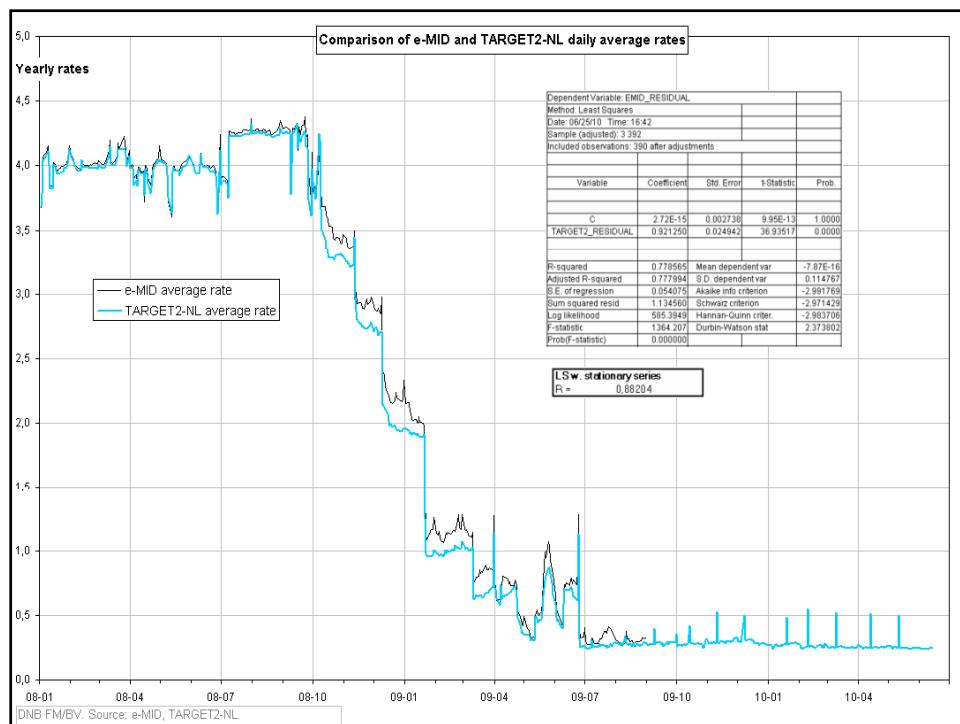
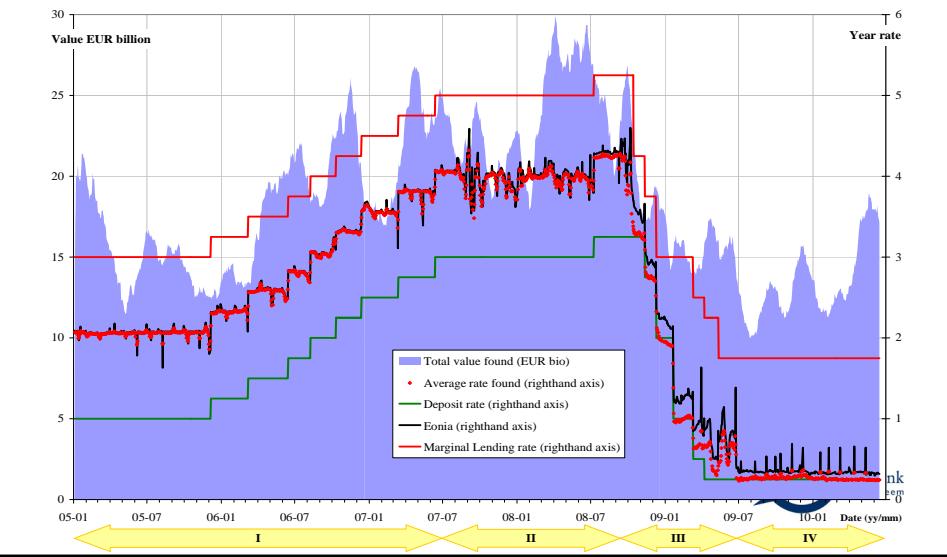
- Type 1 error (false positive): Payment transaction wrongly classified as bank loan
 - not much can be done
- Type 2 error (false negative): True bank loan wrongly rejected
 - Constant monitoring necessary
- Type A error (wrongly assigned to duration)
 - assign to: 1-7-21-30-61-91
 - otherwise assign to shortest duration
 - can be improve by defining bankspecific corridors



Interbank Money market

- Interbank lending and borrowing
- *Eonia*: an effective overnight interest rate computed as a weighted average of all overnight unsecured lending transactions in the interbank market
- Computed by a panel of banks
- Benchmark for money and capital markets in Euro zone

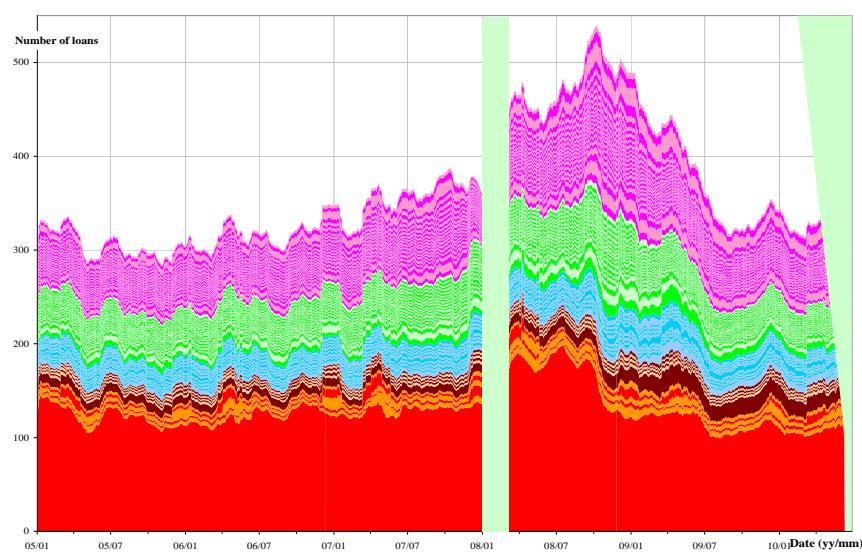
Dutch overnight interest rates and volume development.



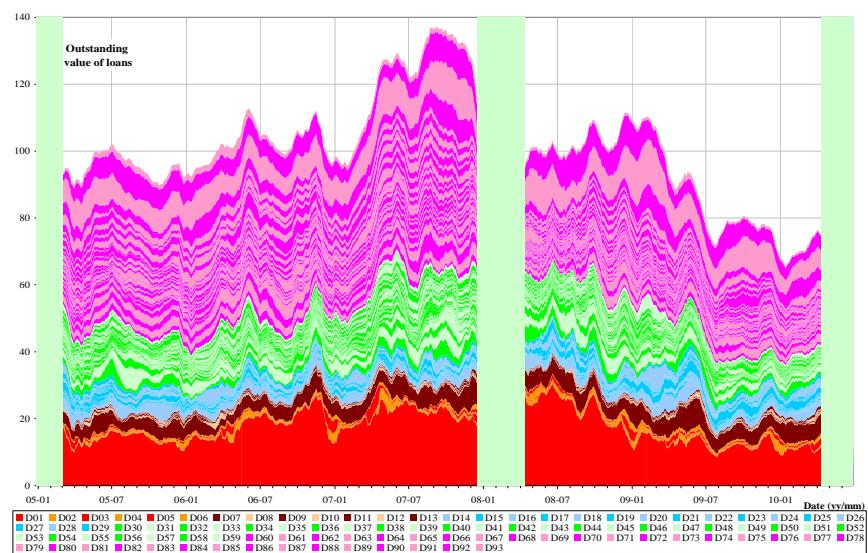
Monitoring Tool

- Development of trading volume and rates in Dutch interbank market
- Comparison of Dutch interbank market with other ones in EU
- In dept study of developments at micro-level: impact of differences between banks, i.e. ratings
- Early warning system

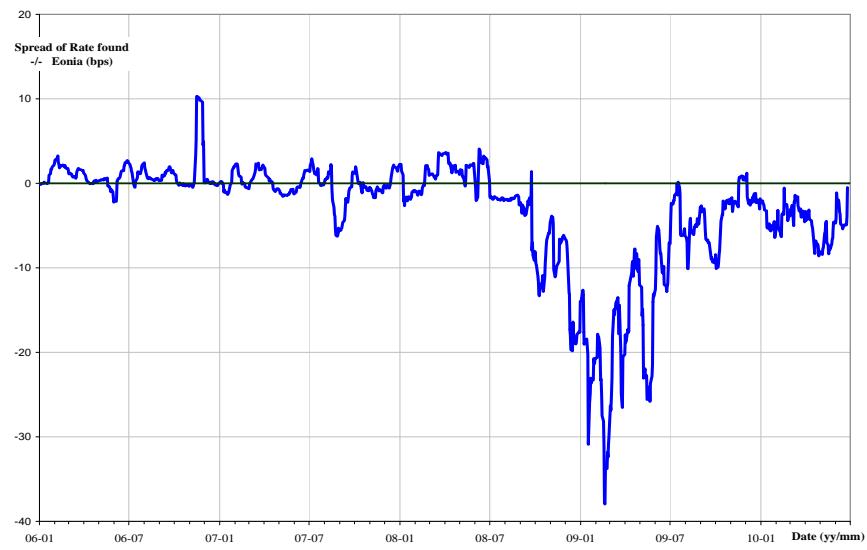
Number of loans by duration



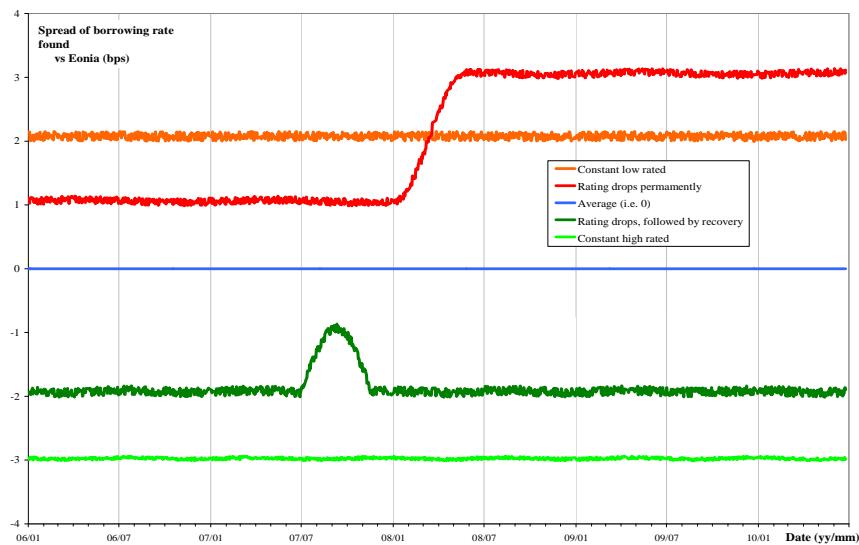
Total outstanding value of loans by duration



Deviation from EONIA (top 5 banks)



Development of interest rates of individual banks



Conclusions (1/2)

- The algorithm to identify interbank loans works well
- Challenge is the identification of the correct maturity
- Banks with extreme low (or high) interest rates can be missed
- Monitoring:
 - Market as a whole: current algorithm is sufficient
 - Individual banks: identification of maturity has to be improved

Conclusions (2/2)

- Significant decrease in both number and value of interbank loans, but not 0.
- No clear shift observed from long to short term lending.
- There is a larger spread in interest rates between banks.
- The average interest rates found are significantly lower than EONIA. Dutch banks pay lower interest rates than European average.
- Lower interest rates found than ESCB overnight deposit