Behaviour of banks during the financial crisis

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Outline

- Current status of research
- Introduction TARGET2 – NL
- Starting point for research
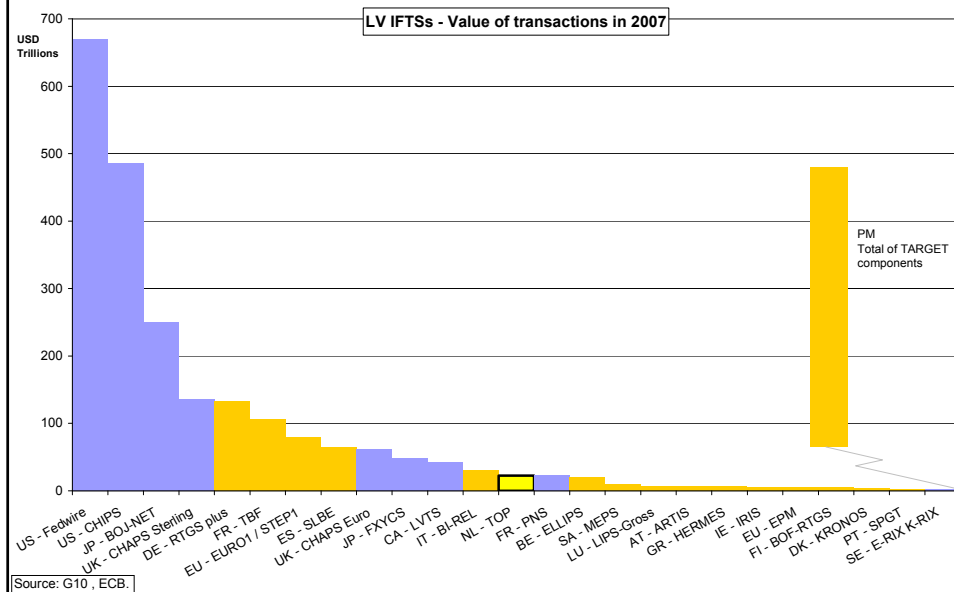- First explorations
- Preliminary conclusions
- Further work

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Current status of research

☑ Starting point
☑ Orientation
☑ First findings
☑ Preliminary conclusions

☐ Quantitative analysis
☐ Publication
☐ Monitoring system and participants
☐ Future simulations

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Introduction TARGET2 – NL (1)

LV IFTSs - Value of transactions in 2007

USD Trillions

700
600
500
400
300
200
100
0

US - Fedwire, US - CHIPS, JP - BOJ-NET, UK - CHAPS Sterling, DE - RTGS plus, FR - TBF, EU - EURO1 / STEP1, ES - SLBE, UK - CHAPS Euro, JP - FXYCS, CA - LVTS, IT - BI-REL, NL - TOP, FR - PNS, BE - ELLIPS, SA - MEPS, LU - LIPS-Gross, AT - ARTIS, GR - HERMES, IE - IRIS, EU - EPM, FI - BOF-RTGS, DK - KRONOS, PT - SPGT, SE - E-RIX K-RIX

PM
Total of TARGET components

Source: G10 , ECB.

Introduction TARGET2 – NL (2)

- Number of direct participants: 80
  number of indirect participants: 40

- Collateral is deposited (pooling country / no repos)

- Connections to ancillary systems
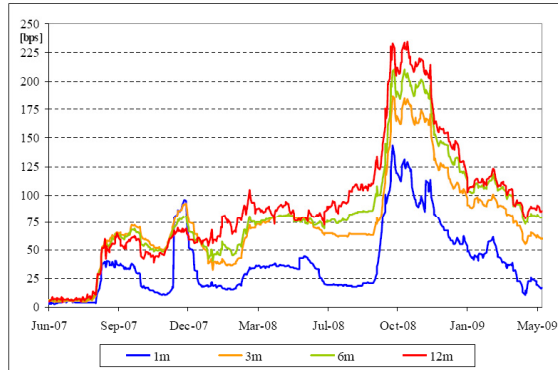 - Settlement (Equens)
  - DVP (ESES)

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Starting point for research

- Financial crisis →

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Financial crisis (1)
Much used measure for tension in interbank markets

EURIBOR - OIS spreads for different maturities
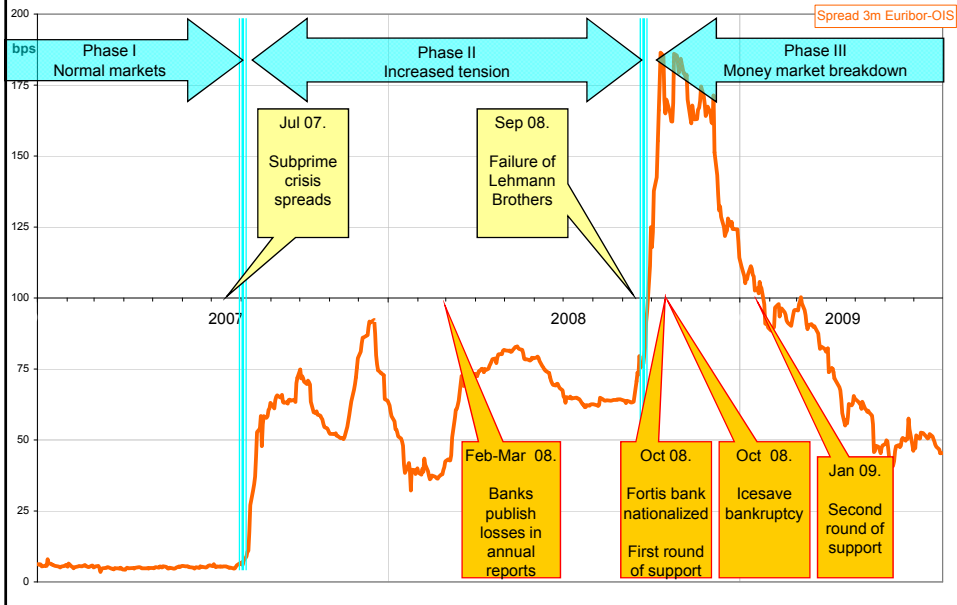

Legend: 1m, 3m, 6m, 12m

Financial crisis (2)
Timeline of global financial crisis

Spread 3m Euribor-OIS

Phase I
Normal markets

Phase II
Increased tension

Phase III
Money market breakdown

Jul 07.

Subprime crisis spreads

Sep 08.

Failure of Lehmann Brothers

Feb-Mar 08.

Banks publish losses in annual reports

Oct 08.

Fortis bank nationalized

First round of support

Oct 08.

Icesave bankruptcy

Jan 09.

Second round of support

Starting point for research

- Financial crisis →
- Have payment system boundaries been reached ?
- Desire to monitor banks more closely
- What are good indicators ?
- Can changes in payment behaviour be found ?
- Can we use indicators in future simulations?

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First explorations (1)
Often used indicators

- Amount and type of collateral
- Monetary loans
- Collateral available in TARGET2
- Amount Intraday credit
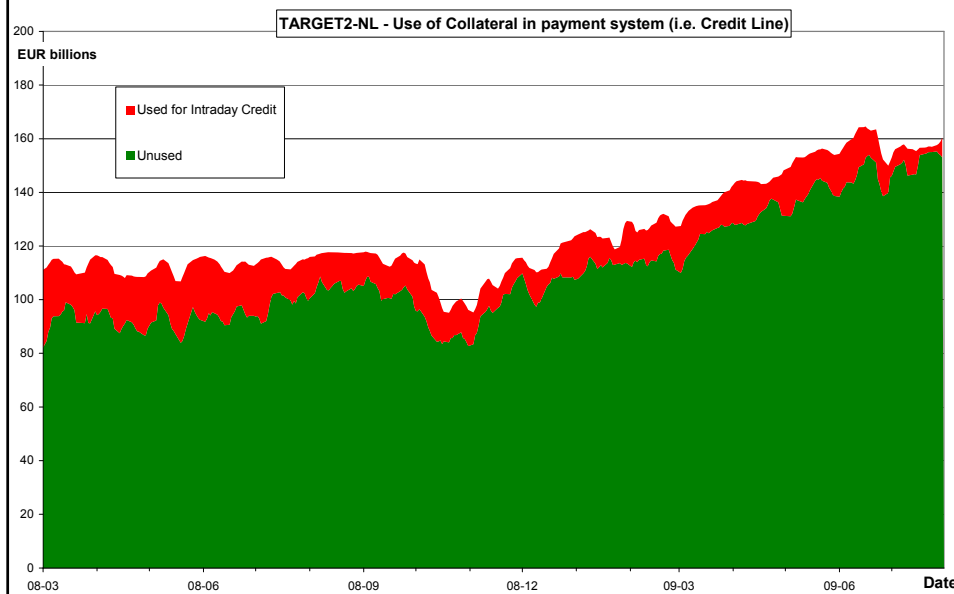- Intraday flow of transactions between participants
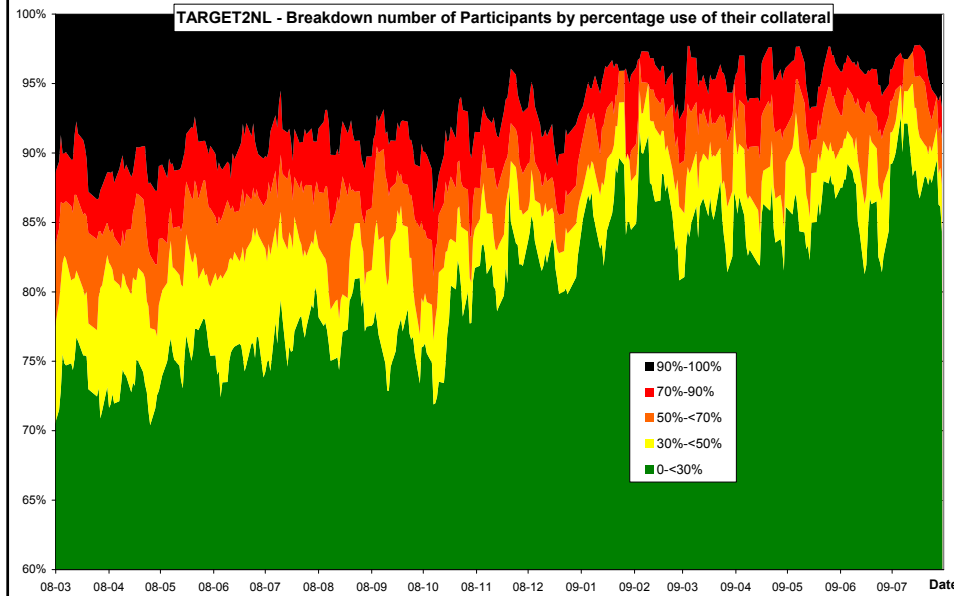
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First explorations (2)

- First look at payments data give no cause for alarm
  - availability and duration of payments
  - amount intraday credit has decreased →

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First explorations (2)
Indicator – Intraday Credit

TARGET2-NL - Use of Collateral in payment system (i.e. Credit Line)

EUR billions

Used for Intraday Credit

Unused

200 180 160 140 120 100 80 60 40 20 0

08-03   08-06   08-09   08-12   09-03   09-06   **Date**

First explorations (2)
Indicator – Intraday Credit - Forestfire

TARGET2NL - Breakdown number of Participants by percentage use of their collateral

Legend:
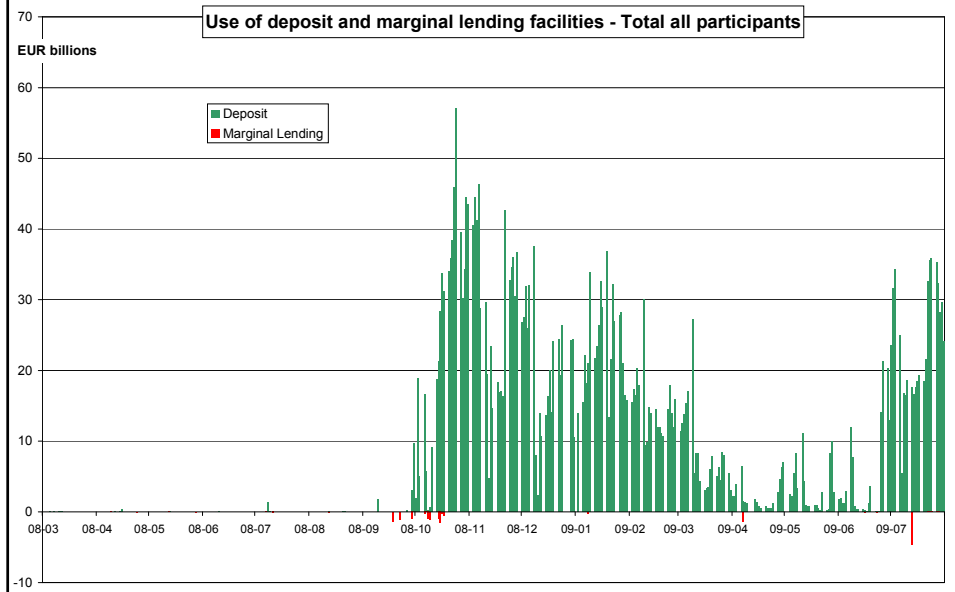- 90%-100%
- 70%-90%
- 50%-<70%
- 30%-<50%
- 0-<30%

First explorations (2)

- First look at payments data give no cause for alarm
  - system availability, duration of payments
  - amount intraday credit has in fact DEcreased →

- But a closer look shows that
  - banks have deposited large amounts of collateral,
  - started to use ECB liquidity providing operations and
  - also started using standing facility (deposit) →

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First explorations (2)
Total collateral deposited

Use of total collateral pool

EUR billions

- Used for monetary loans
- Used for Intraday Credit
- Unused
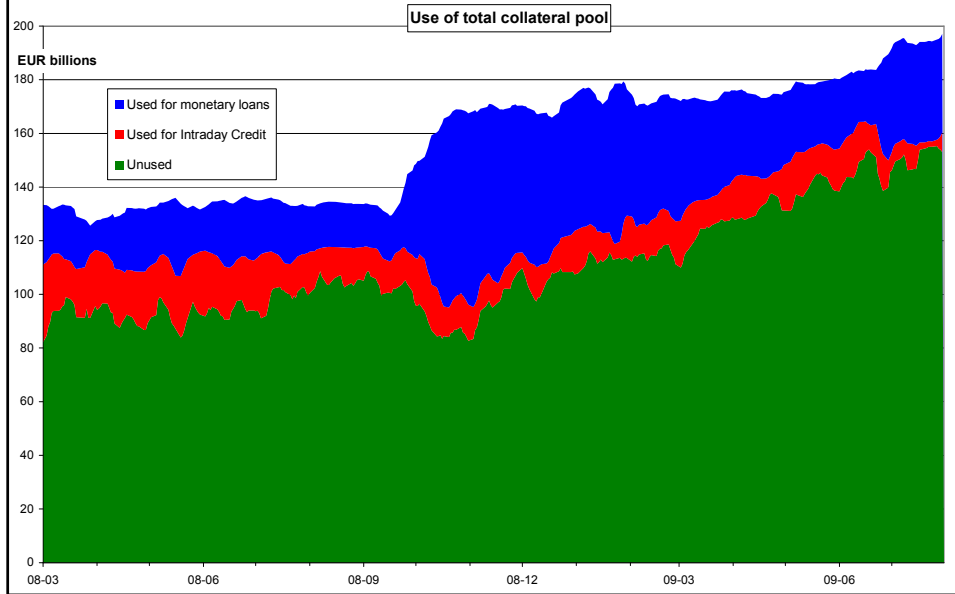
First explorations (2)
Use of Standing facility

Use of deposit and marginal lending facilities - Total all participants

EUR billions

- Deposit
- Marginal Lending

First explorations (3)
Searching for more indicators

- Which type of transactions mostly reveal behaviour →

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First explorations (3)
Type / time of transactions
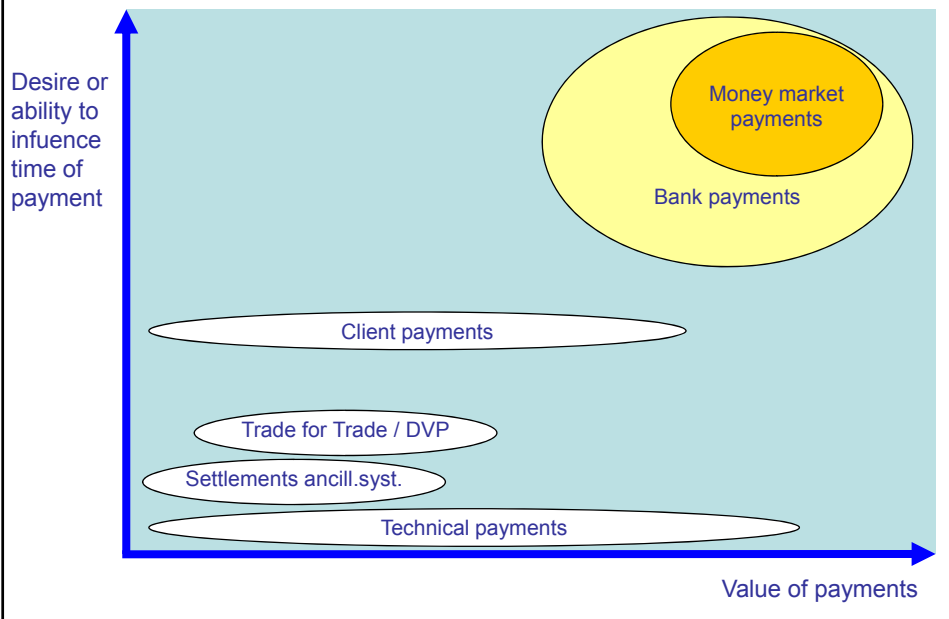
Desire or ability to infuence time of payment

Money market payments

Bank payments

Client payments

Trade for Trade / DVP

Settlements ancill.syst.

Technical payments

Value of payments

First explorations (3)
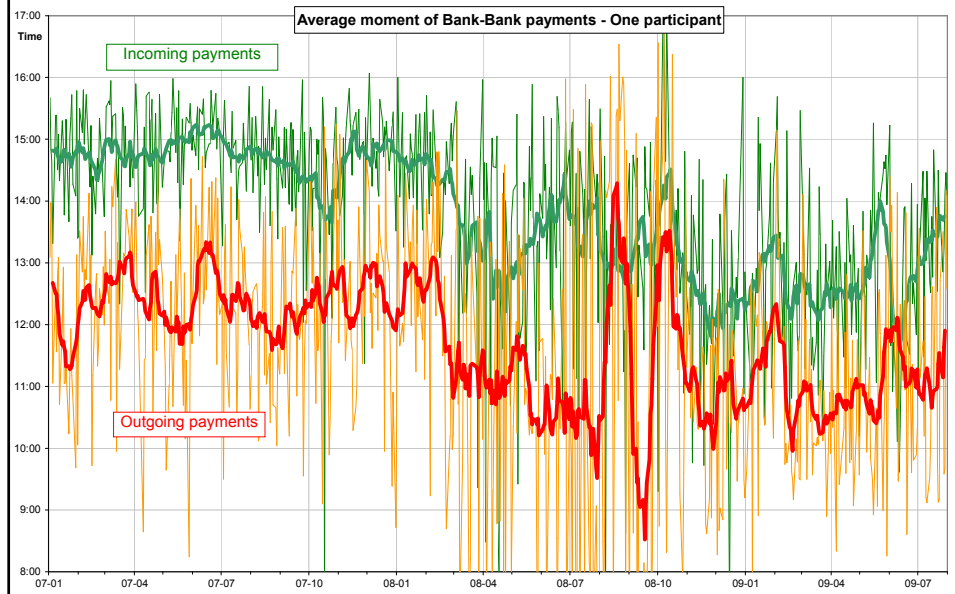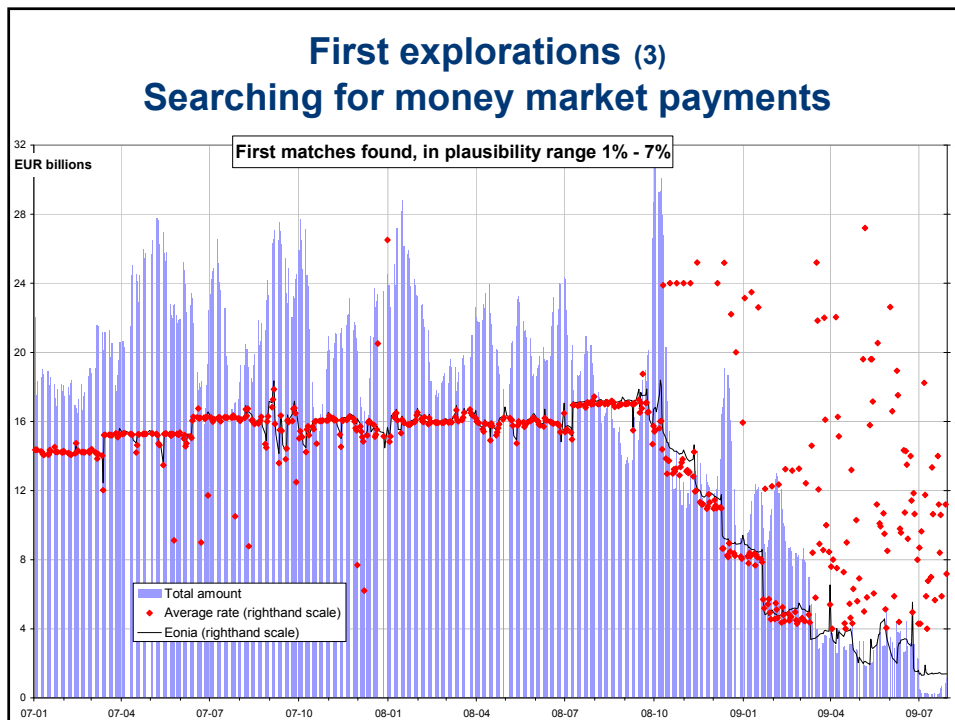## Searching for more indicators

- Which type of transactions mostly reveal behaviour →
- Zooming in:
  - all payments > group of participants > individual
    participants
  - all payments > bank payments > moneymarket
- Timing of payments →
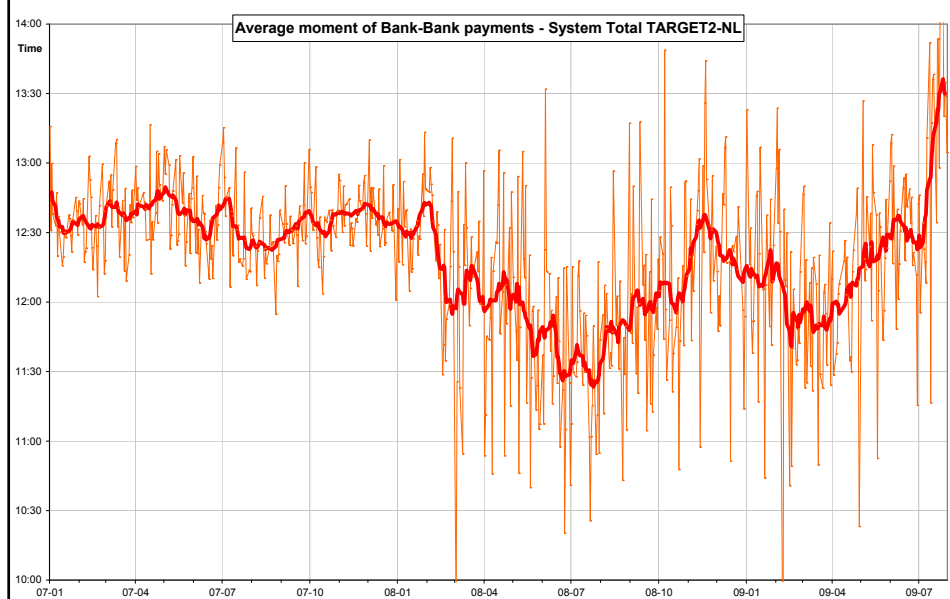
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First explorations (3)
Indicator: timing of payments

Average moment of Bank-Bank payments - System Total TARGET2-NL

First explorations (3)
Indicator: timing of payments

Average moment of Bank-Bank payments - One participant

Incoming payments

Outgoing payments

First explorations (3)
Searching for more indicators

- Which type of transactions mostly reveal behaviour ›
- Zooming in:
  - all payments > group of participants > individual
    participants
  - all payments > bank payments > moneymarket
- Payment flows (incoming outgoing per quarter)
- Timing of payments ›
- Timing of money market payments ›

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First explorations (3)
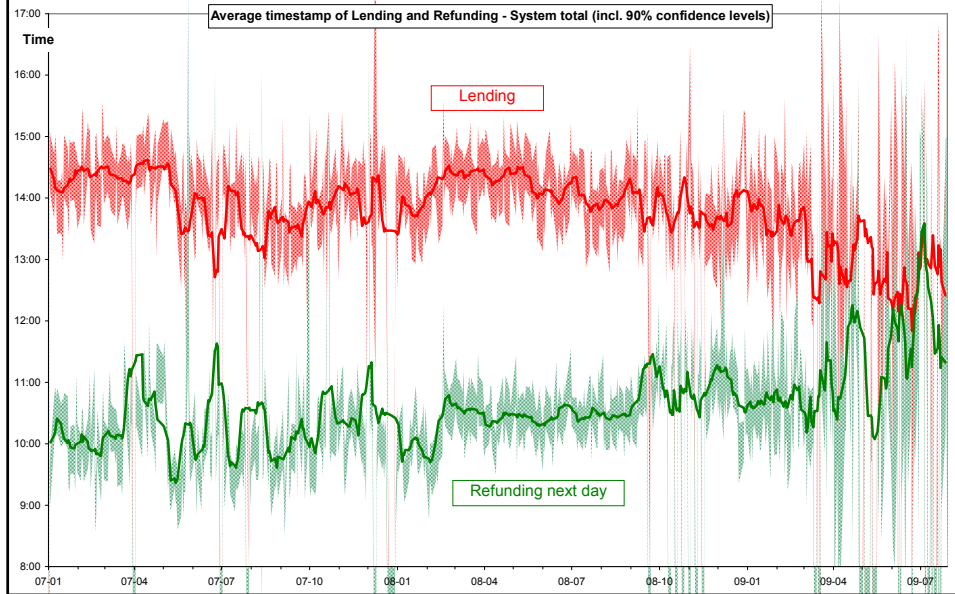## Searching for money market payments

- Methodology introduced by Craig Furfine, 1999, BIS

- Payment on day *t*
- from participant **A** to **B**
- amount **X**
  (rounded to 10 mln euro)

- Payment on day *t+1*
- from participant **B** to **A**
- amount **X**
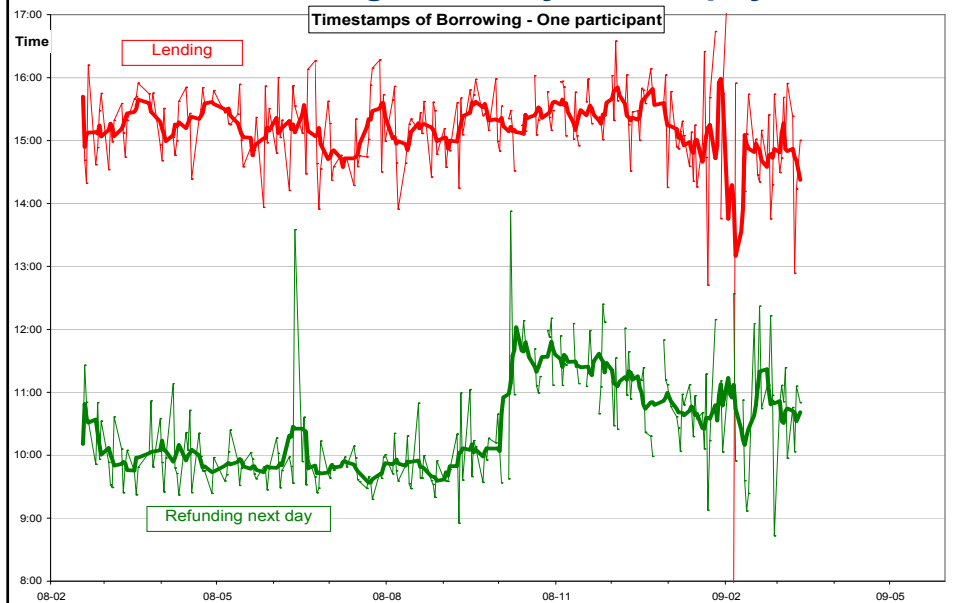 *plus*
  plausible
  interest rate

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First explorations (3)
Searching for money market payments

First matches found, in plausibility range 1% - 7%

EUR billions

Total amount
Average rate (righthand scale)
Eonia (righthand scale)

First explorations (3)
Indicator: timing of money market payments

Average timestamp of Lending and Refunding - System total (incl. 90% confidence levels)

Lending

Refunding next day

First explorations (3)
Indicator: timing of money market payments

Timestamps of Borrowing - One participant

Lending

Refunding next day

First explorations (3)
Indicator: timing of money market payments

Timestamps of Lending - One participant
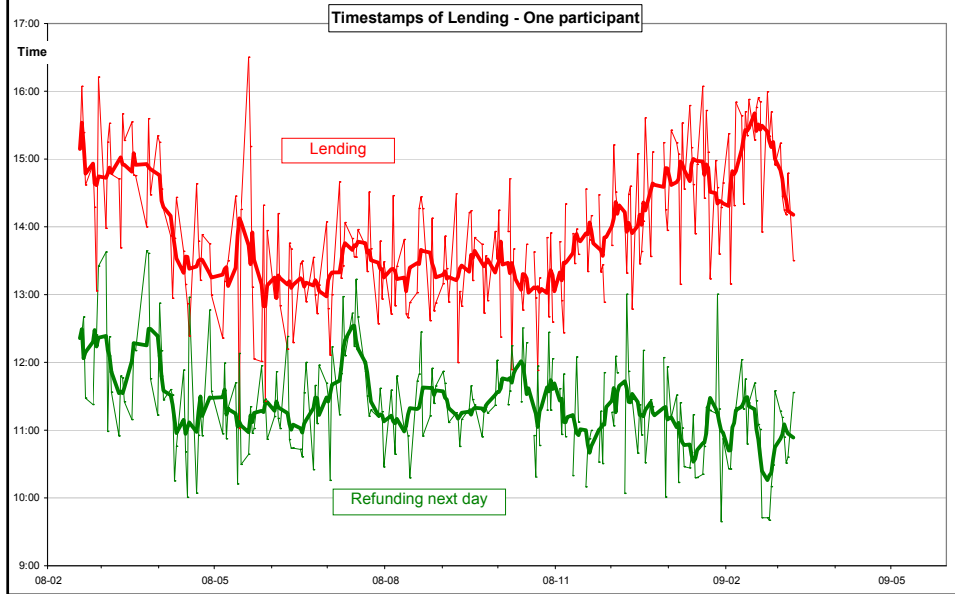
Choosing when to (re)pay money market loans
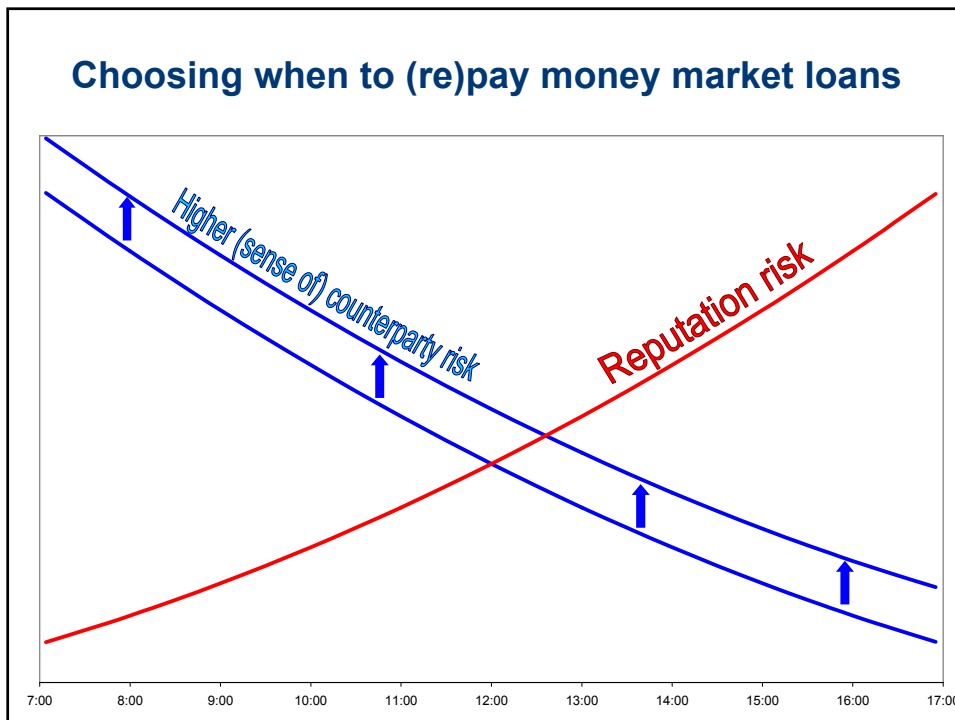
First explorations (4)
Added value of combining different indicators

Changes in indicators:
- (Type of) Collateral posted
- Monetary loans
- Amount Intraday credit
- Use of Standing facility
- Changes in timing of payments
- Others..

Analysed individually,
forms clues,
give low probability

Analysed in combination,
gives more certainty

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First explorations (4)
Added value of banknote transactions

- Banknotes circulation:
  - withdrawals by private persons
  - deposits by businesses
- Banks are often net withdrawing or net depositing
- Seasonally patterns: end of month, holidays

Deposits

Withdrawals

X

X

net withdrawals . . . . . afterward caught up

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First explorations (4)
Added value of banknote transactions

First explorations (4)
Added value of banknote transactions
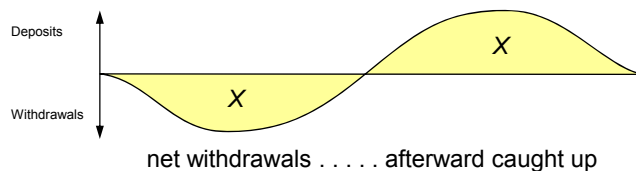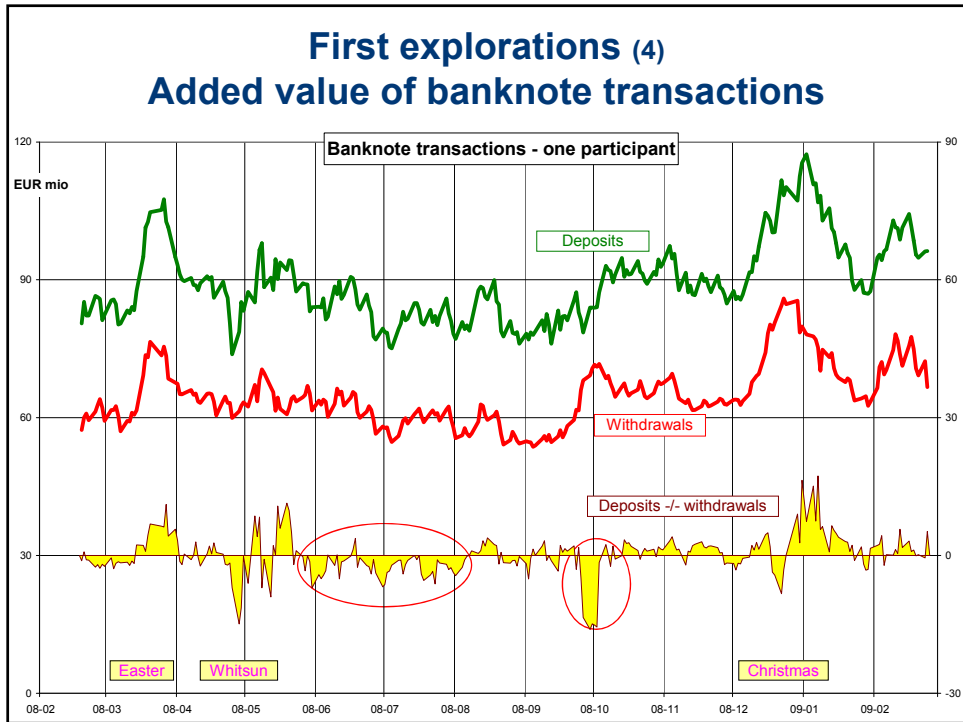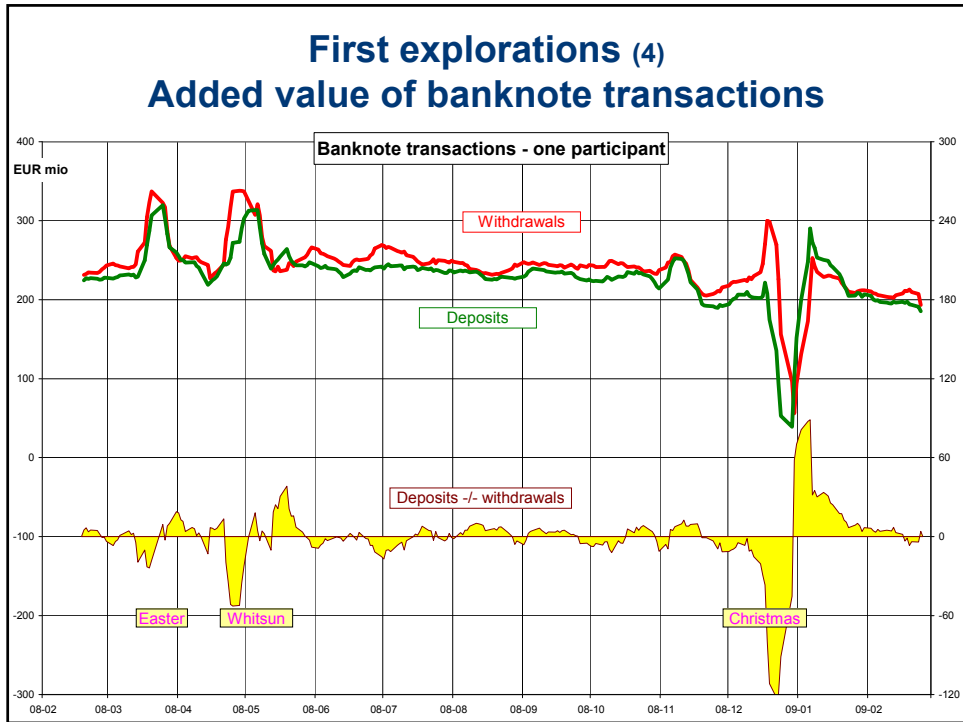
Preliminary conclusions

- Payment systems data only delivers part of the picture
- Although money market has dried up, payment kept rolling as a result of the liquidity provision by the ECB
- A few participants have suffered from lack of liquidity (maybe also lack of reputation)
- Payment behaviour seems to be influenced by fear of loss of reputation
- Zooming in and out . . . up to ideal point
- Combining different indicators strengthens conclusions

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Future work

- Validation of matching money market payments
- Quantifying seasonal patterns
- Analysing causality of behaviour between participants
- Publication
- Monitoring individual participants:
  - amount of available collateral, intraday credit
  - use of deposit facility + marginal lending
  - shift of payments towards end of day
- Simulations including extreme loss of confidence in counterparties:
  - (How fast) can extreme postponing of high value payments lead to failure

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