Money talks!
Nowcasting real economic activity with payment systems data

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Payment systems data: what are we addressing here?

- "A Payment system is a set of instruments, procedures and rules for the transfer of funds between or among participants" (BIS, 2012)

- Payment systems are generally categorized in:
  - Retail payment systems: funds transfer system that handles with large volume of relatively low-value payments
  - Large-value payment systems: funds transfer system that handles large-value and high-priority payments, which are operated by central banks
Payments data disseminated by Banco de Portugal

- This information is compiled and disseminated via the Banco de Portugal’s statistical dissemination tool (BP Stat)

### Payment systems statistics
- Overall characterisation of the Portuguese payment system
  - Institutions offering payment services in Portugal (Time series: 6)
  - Number of participants in the Portuguese clearing and settlement systems (Time series: 18)
  - Transactions per type of payment instrument (Time series: 18)
  - Number of payment cards issued in Portugal (Time series: 3)
  - Number of ATM and POS terminals in Portugal (Time series: 4)
  - Payment card transactions by location of the terminal and card issuing country (Time series: 14)
- Interbank clearing and settlement systems in Portugal
- Payment instruments in the interbank clearing and settlement systems
- Transactions processed through European clearing and settlement systems
Payments data as a tool to nowcast the consumption of non-durable goods and services

- Two major arguments for the usage of ATM and POS data in nowcasting the consumption of non-durable goods (Esteves, 2009):
  - Data are **truly associated** with the reality it seeks to portray
  - Data are **available very frequently** and in a **timely manner** – “*typically just a couple of days after the end of the month*” (Esteves, 2009)
- The forecasting performance of these data can be benchmarked against relevant competing indicators: Retail trade sales, consumer confidence level and consumption of electricity

\[
\Delta^4 C_t = c_0 + \sum_{i=1}^4 \alpha_{t-i} \Delta^4 C_{t-i} + \beta_t \Delta^4 I_t
\]

**Forecasting performance evaluation equation**

- Year-on-year growth rate of the consumption of non-durables
- Different competing indicators

Source: Esteves (2009)
Payments data as a tool to nowcast the consumption of non-durable goods and services

- Using the previous model, the computation of the root mean square error for the out of sample forecasting with the different competing indicators depicts the forecasting quality of payment systems data:

<table>
<thead>
<tr>
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<th>Single equation forecasts</th>
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<th>Single equation forecasts</th>
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<tbody>
<tr>
<td></td>
<td>Yoy</td>
<td>Δyoy</td>
<td>Yoy</td>
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<tr>
<td>Retail trade</td>
<td>0.36</td>
<td>0.33</td>
<td>0.40</td>
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<tr>
<td>Consumer confidence</td>
<td>0.54</td>
<td>0.57</td>
<td>0.62</td>
</tr>
<tr>
<td>Electricity consumption</td>
<td>0.35</td>
<td>0.34</td>
<td>0.37</td>
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Smaller forecasting errors, with the advantage of being relatively cheaper and more timely

Source: Esteves (2009)
Using payments data as a crisis performance indicator

- Typically, payments data are **strongly associated with key macroeconomic variables**

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Source: *Banco de Portugal*

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Using payments data as a crisis performance indicator

- These data can be used to monitor the performance of the economy!

Value of customer operations settled through TARGET2-PT and real GDP (Growth rates)

Source: Banco de Portugal
Using payments data as a crisis performance indicator

- These data can be used to **monitor the performance of the economy**!

**Percentage of cheques returned for insufficient funds in the accounts and GDP growth rates**

Source: *Banco de Portugal*
Using payments data as a tool for short term macroeconomic monitoring

- But this is not all! One can also use payment systems data to monitor the impact of extemporaneous events

Source: Banco de Portugal
Conclusions and way forward

- Cashless payment instruments are **continuously gaining more importance** and the data they generate can be very useful for statisticians.

- Payment systems data are:
  - **widely available** from international organizations and, typically, from national central banks and **free of charge**
  - **available very frequently** and in a **timely manner** – just a few days after the end of the month
  - **truly related** with macroeconomic phenomena
  - allowing the monitoring of the consumption of non-durables, with an improvement in the **availability/cost relation** and with **comparable quality**

**An opportunity for statisticians and researchers worldwide!**
Thank you for your attention!

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