Benchmarking monthly indicator series with structural quarterly series

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Statistics Netherlands uses, like most northwestern European countries, *Value Added Tax* for *turnover* estimates.

- **Annual statistics**: VAT complete
- **Quarterly statistics**: VAT almost complete (> 95 % covered)

When complete; VAT-data for all commercial enterprises

High-quality *turnover level* and *turnover growth rate* estimates can be produced with VAT for annual and quarter (results European ESSnet AdminData project)
Introduction: challenge month

- Setup for VAT-based annual / quarterly turnover estimate is
  - a large enterprise survey (LE-survey)
  - VAT for medium and small enterprises

- CHALLENGE = MONTH,
  - no (or only selective) VAT available

- RESEARCH QUESTION
  - alternative for ‘standard’ survey for month knowing that VAT becomes available later?
### Monthly Indicator

<table>
<thead>
<tr>
<th>Quarterly/Annual</th>
<th>Monthly</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 100% sample L.E.</td>
<td>- 100% sample L.E.</td>
</tr>
<tr>
<td>- VAT quasi-complete</td>
<td>- VAT (not or limited)</td>
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<tr>
<td>(almost all) admin data &amp; longer production time</td>
<td>few data &amp; short production time</td>
</tr>
<tr>
<td>Reliable information on the overall level and long-term movement</td>
<td>Explicit information about the short-term movement</td>
</tr>
<tr>
<td>The &quot;structural&quot; series</td>
<td>The &quot;indicator&quot; series</td>
</tr>
</tbody>
</table>
Relationships between series

Retail trade: structural bias

Growth rate: \( t: t-12 \)

- \( t \geq 100 \) persons employed
- Retail trade: all enterprises

Periods: 200501 to 201112

SBR, NACE, SBR + VAT\(_Q\)
Month: the strategy

General problem: Temporal estimation of small/medium enterprises

- observed (large) enterprises detect short-term growth movement
- observed (large) enterprises DO NOT detect short-term growth movement

\[ \text{growth MSE}_{t} = \text{growth LE}_{t} \times C_{\text{benchmarking}} \]

- Simple: \( C_{\text{benchmarking}} = 1 \)
- Sophisticated: \( C_{\text{benchmarking}} < > 1 \)

\[ \text{growth MSE}_{t} = \text{growth MSE}_{t-1} \times C_{\text{nowcasting}} \]

- Simple: \( C_{\text{nowcasting}} = 1 \)
- Sophisticated: \( C_{\text{nowcasting}} < > 1 \)

Statistics Neth., UK, (Statistics Can.)
Statistics Finland, Statistics Neth., UK
Benchmark nowcasting

benchmarking

benchmark nowcasting

indicator series (Q)
structural series (A)
benchmarked indicator series (Q)

structural bias
adjustment
b_nowcast implicit
b_nowcast explicit
DATA

- Month - Indicator series:
  \textsc{LE}-survey \ (survey > 100 \, p.e. \, ; \, 100 \, \% \, sample; \, share \, \approx \, 40 \, \%)

- Quarter - Structural series:
  \textsc{LE}-survey + \text{VAT}

TECHNICAL INFORMATION

- Proportional Denton-method

- Explicit benchmark nowcast:
  \( Q_{t+2} \) \ : \ average \ bias \ over \ last \ 9 \ months
Results retail trade (the Netherlands)
benchmark nowcast versus publication
Findings (indicator = LE-survey)

- Tested several ‘benchmark’ formulas
  - No ‘overall’ winner

- Benchmark nowcasting provides satisfying results if...
  - **panel-based series** are used as indicator

  *(no merges, split-offs, starters, stopper in indicator)*
Test 2: Services (the Netherlands)

DATA
- Month - Indicator series:
  expectation survey \( (N_{\text{increasing turnover}} - N_{\text{decreasing turnover}}) \)

- Structural series - Quarter:
  LE-survey + VAT \( (Y_{\text{turnover}}) \)

TECHNICAL INFORMATION
- Proportional Denton-method

- Expliciet benchmark forecast:
  - \( Qt+2 \) : average bias over last 9 months
Results services (the Netherlands)
Results services (the Netherlands)

Services: art.turnover versus VAT-turnover

- turnover (VAT)
- art. turnover (initial)
- art.turnover (benchmarknowcast)
Conclusions

• Benchmarknowcasting may be used if indicator measures short-term movement growth *(use later available VAT to check assumption)*

• Benchmarknowcasts provide good results, if indicator is LE-survey *(quicker estimates at lower costs)*

• Panel-based series recommended

ONGOING RESEARCH

• Selecting indicator series *(precise sampling, other datasources)*

• Risk analyses
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