International Seminar on Timeliness, Methodology and Comparability of Rapid Estimates of Economic Trends
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Session 4: Extrapolating, Modelling econometric and sampling techniques used in the preparation of rapid estimates

A system of rapid estimates to improve real time monitoring of the economic situation: the case of euro area

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- Increasing data timeliness
  - Use of statistical and econometric techniques
  - Coincident indicators
- Monthly indicator of the economic activity
  - EuroMIND
- A statistical framework for business cycle analysis
  - Euro area turning point coincident indicators
  - Growth cycle estimates
- Conclusions
Introduction

- Clear picture of economic movements
  - timely available statistics and statistical indicators
- Relevant improvements of PEEIs since 2002
  - timeliness
  - coverage
- Timeliness gap between Euro Area and USA
- PEEIs improvements:
  - increasing timeliness without lost of accuracy
  - long time series
  - high frequency data
  - extracting signals by means of specific indicators
Increasing data timeliness

- Speeding up data production process
  - advanced survey techniques
  - simplification of questionnaires
- Now-casting by means of statistical and econometric techniques
  - incomplete information set
- EU sampling techniques
  - not significant national samples
- Construction of coincident indicators
  - anticipating latest economic trends
Use of statistical and econometric techniques

- Using forecasting techniques to estimate the recent past and the present
- Not all forecasting models are admissible in official statistics
- Key principles of the construction of Flash Estimates:
  - Use of all partial information whenever available
  - Use of soft data only combined with a minimum of hard data
  - Use of related indicators only in case of unavailability of relevant partial information
  - Avoiding economic hypotheses in the model specifications
  - Discarding univariate model specifications
  - Selecting simple methodologically sound models
## Euro Area Flash Estimates of Producer Price Index

<table>
<thead>
<tr>
<th></th>
<th>Flash t+16</th>
<th>Eurostat First estimate</th>
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Coincident indicators

- Forecasting the target variables during the reference period or right after its end
  - similar philosophy of Leading Indicators
- Fewer constraints in model specifications than Flash estimates
  - still avoiding economic hypotheses in model specifications
- Ongoing Eurostat projects on euro area coincident indicators
  - GPD, Employment, IPI
- Unsatisfactory results for IPI
  - high degree of volatility
- Alternative specifications of euro area GDP coincident indicators
  - three different Bridge equation models
  - a dynamic factor model
### Euro area Coincident Indicators of the GDP growth

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<tr>
<th>Year</th>
<th>Estimates t-30</th>
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</table>
Monthly indicator of the economic activity

- Declining role of IPI as reference variable for business cycle analysis
  - service activities also characterized by cyclical movements
  - industrial fluctuations not necessary determine cycles for the whole economy
- GDP: ideal reference variable for business cycle analysis
  - only available at quarterly basis
  - construction of monthly GDP based on EA principles still problematic
- Several attempts to construct monthly proxies of GDP
  - Sweden, Finland, Estonia, U.K., Canada
- Ongoing Eurostat projects on the construction of euro area monthly indicator of the economic activity
Euro-MIND: methodological description

- Construction based on quarterly GDP, output and expenditure side components
- Selection for each component of a set of quantitative and qualitative monthly related indicators
- Modelling monthly indicators using a dynamic factor analysis casted in a state–space form
- Dealing with multi frequency data in a state-space form in order to convert temporal aggregation into a systematic sampling problem
- Achieving computational efficiency by converting a multivariate estimation problem into an univariate filtering and smoothing one
- Dealing with chain-linking measures by means of a multistep procedure exploiting the additivity property of Laspeyres volume measures on previous year basis
- Estimating Euro-MIND as a combination of output and expenditure estimates using weights reflecting the relative precision
Euro-MIND growth rate on previous month
A statistical framework for business cycle analysis

- Not all needed information explicitly available by a simple data inspection
- Extracting signals and producing estimates for a better understanding of cyclical movements
- Eurostat ongoing activities aiming to the construction of a statistical framework for business cycle analysis
  - construction of chronologies
    - growth cycle, classical cycle
  - construction of coincident turning point indicators
  - estimates of growth cycle (i.e. output gap of GDP)
    - univariate and multivariate methods
Euro area turning point coincident indicators

- simultaneous analysis of classical business cycle and growth cycle in the so called ABCD framework
- statistical dating of euro area turning points by means of a simple non parametric dating rule
- comparison of euro area and Member States dating to achieve a final statistical chronology ensuring the maximum degree of consistency between the two approaches
- preliminary investigation of alternative models for the construction of coincident turning point indicators for classical business cycle and growth cycle
- variables selection for the growth cycle coincident indicators
  - Employment expectation, Construction confidence indicator, Financial situation of the last 12 months, IPI, Imports of intermediate goods
- construction of the growth cycle coincident indicators (GCCI) as a weighted mean of the transition probability returned by the five univariate two regimes Markov Switching models
  - equal weighting scheme
- variables selection for the business cycle coincident indicators
  - IPI, Unemployment rate, New cars registration
- construction of the business cycle coincident indicators (BCCI) as a weighted mean of the transition probability returned by the three univariate three regimes Markov Switching models
  - weighting scheme: 0.34, 0.46, 0.20 respectively
GCCI

Probability of Being in Recession

Jan-07 Feb-07 Mar-07 Apr-07 May-07 Jun-07 Jul-07 Aug-07 Sep-07 Oct-07 Nov-07 Dec-07 Jan-08 Feb-08 Mar-08 Apr-08 May-08 Jun-08 Jul-08 Aug-08 Sep-08 Oct-08 Nov-08 Dec-08 Jan-09 Feb-09 Mar-09 Apr-09 May-09 Jun-09

GCCI  Forecasts  0.5 Threshold
BCCI

Probability of Being in Recession

Jan-07 Feb-07 Mar-07 Apr-07 May-07 Jun-07 Jul-07 Aug-07 Sep-07 Oct-07 Nov-07 Dec-07 Jan-08 Feb-08 Mar-08 Apr-08 May-08 Jun-08 Jul-08 Aug-08 Sep-08 Oct-08 Nov-08 Dec-08 Jan-09 Feb-09 Mar-09 Apr-09 May-09 Jun-09

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1

BCCI Forecasts 0.5 Threshold
Growth cycle estimates

- Crucial importance of growth cycle estimates for policy makers and analysts
  - monitoring the inflationary pressures
  - designing a monetary policy oriented to inflation control
- Trend–cycle estimated by means of filtering techniques
  - data revisions
  - end points estimates
- Ongoing Eurostat activities for the estimation of growth cycle
  - regular production of univariate growth cycle estimates
    • Hodrick-Prescott, Christiano-Fitzgerald, Unobserved Components models
- Studying alternative multivariate growth cycle estimates
  - structural VARs, Unobserved components
EA GDP trend-cycle decomposition using HP filter
Conclusions and improvement lines

- incorporating as much as possible national information into euro area models
- Investigating the possibility of constructing estimates using an indirect approach and working at Member States level
- investigating the usefulness of introducing additional data sources into our models
  - EuroMIND
- analysing more sophisticated data and models selection techniques
- testing alternative specification of turning point coincident indicators
  - reducing their lagging characteristics
- constructing a chronology and a turning point indicator also for the acceleration cycle
- studying alternative solutions to increase the reliability of endpoint estimates of detrending filters