Quality in Seasonal Adjustment: Confidence Intervals

N. Alpay KOÇAK

Turaç YAVUZ   Özlem YİĞİT

Vienna, 2–5 June 2014

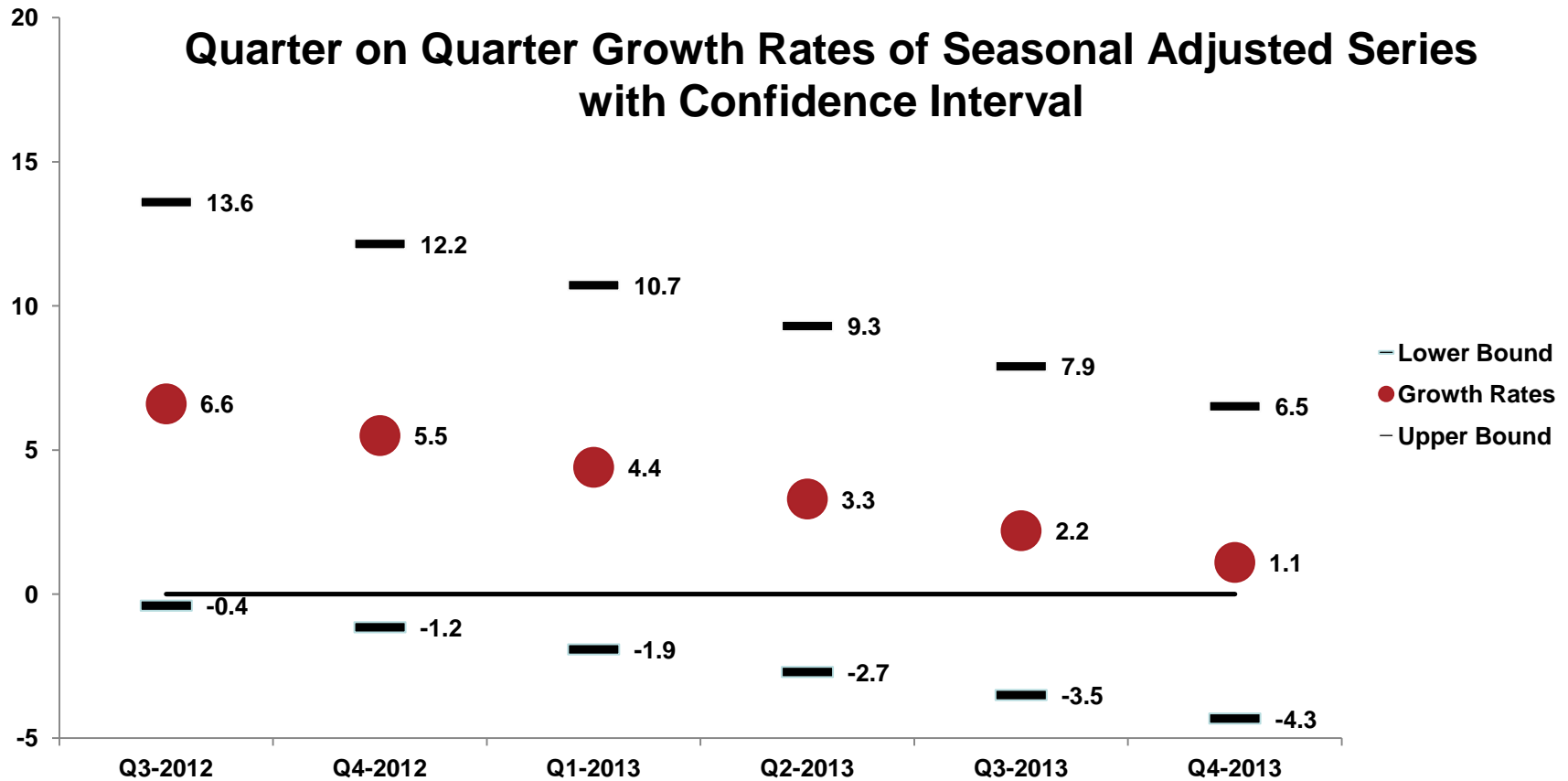Schönbrunn Palace
Conference Centre

Outline

- Motivation

- Methodology

- Proposed methodology

- Results

  - M1 monetary aggregates

 - Gross Domestic Product

- Conclusion

Motivation

- Aim of seasonal adjustment

- Classical quality checks

- Importance of sa series

Importance of SA series for Policy Makers

Quarter on Quarter Growth Rates of Seasonal Adjusted Series with Confidence Interval

Importance of SA series for Policy Makers

Quarter on Quarter Growth Rates of Seasonal Adjusted Series with Narrow Confidence Interval
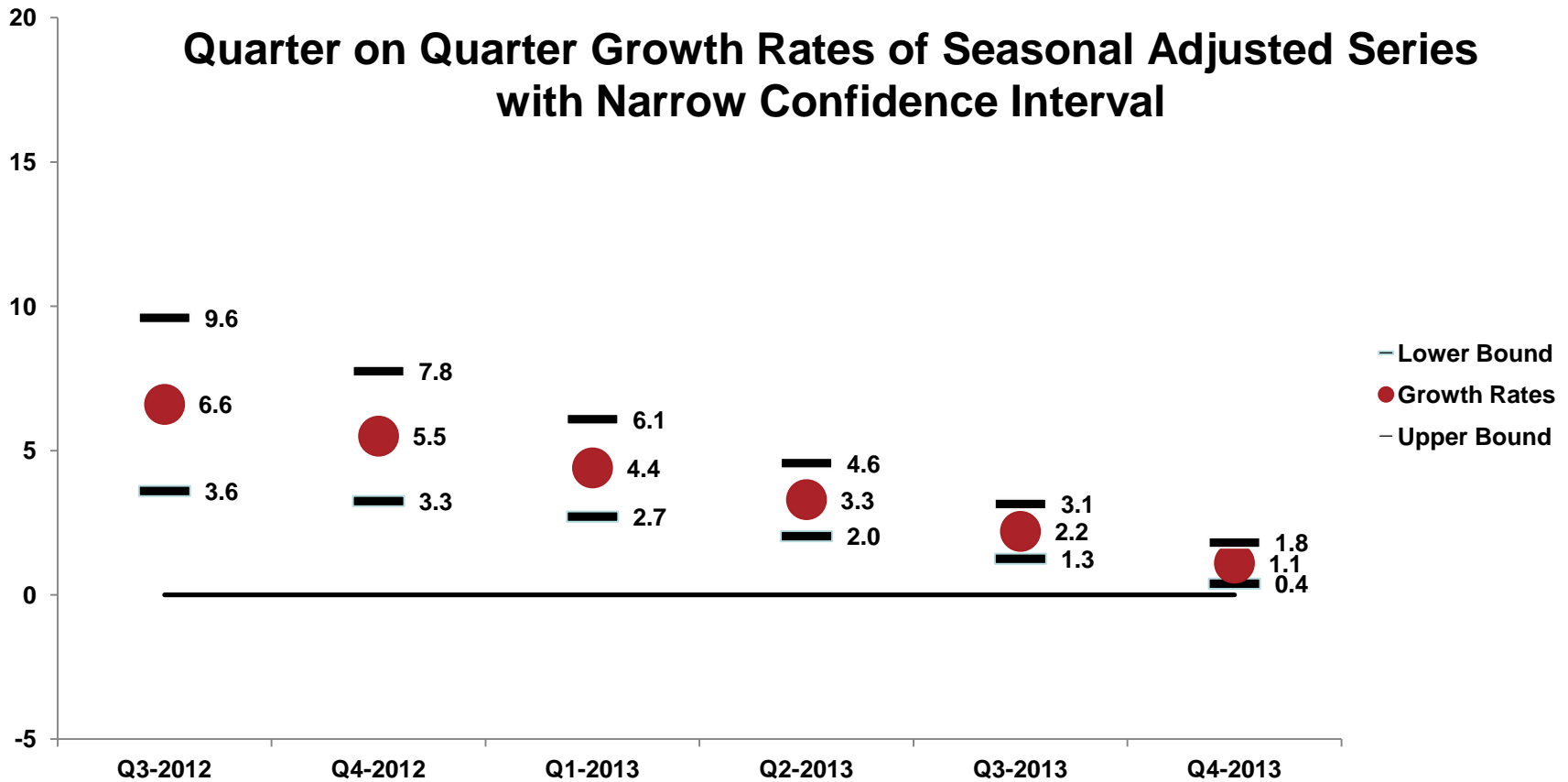
Methodology

Standard methodology of TRAMO

- log-level specification

- estimate unit roots

- identify ARMA model orders

HR method is based on modified BIC criteria. In HR method, smallest five BIC are first ordered in ascending order. Then, the model which has less parameter in seasonal part is selected considering with change in BIC value.

Proposed Methodology

"Policy Makers Information Criteria (PMIC) "

First, BIC values which belongs all possible models are ordered in ascending order.

Then, PMIC is calculated for smallest ten models according to BIC criteria.

$$PMIC_i = \left\{ \left(\frac{BIC_i - \overline{BIC_i}}{\sigma_{BIC_i}} \right) \left(\frac{SE_{G_t,SA_i} - \overline{SE_{G_t,SA_i}}}{\sigma_{G_t,SA_i}} \right) \right\}$$

Then, the model has the smallest value is selected.

Application

- EU-28 GDP Data

- Eu-28 M1 Data

- Time span of the data set varies across the countries for each variable.

- Results of PMIC are obtained and compared with TS' results in terms of diagnostics and graphical.
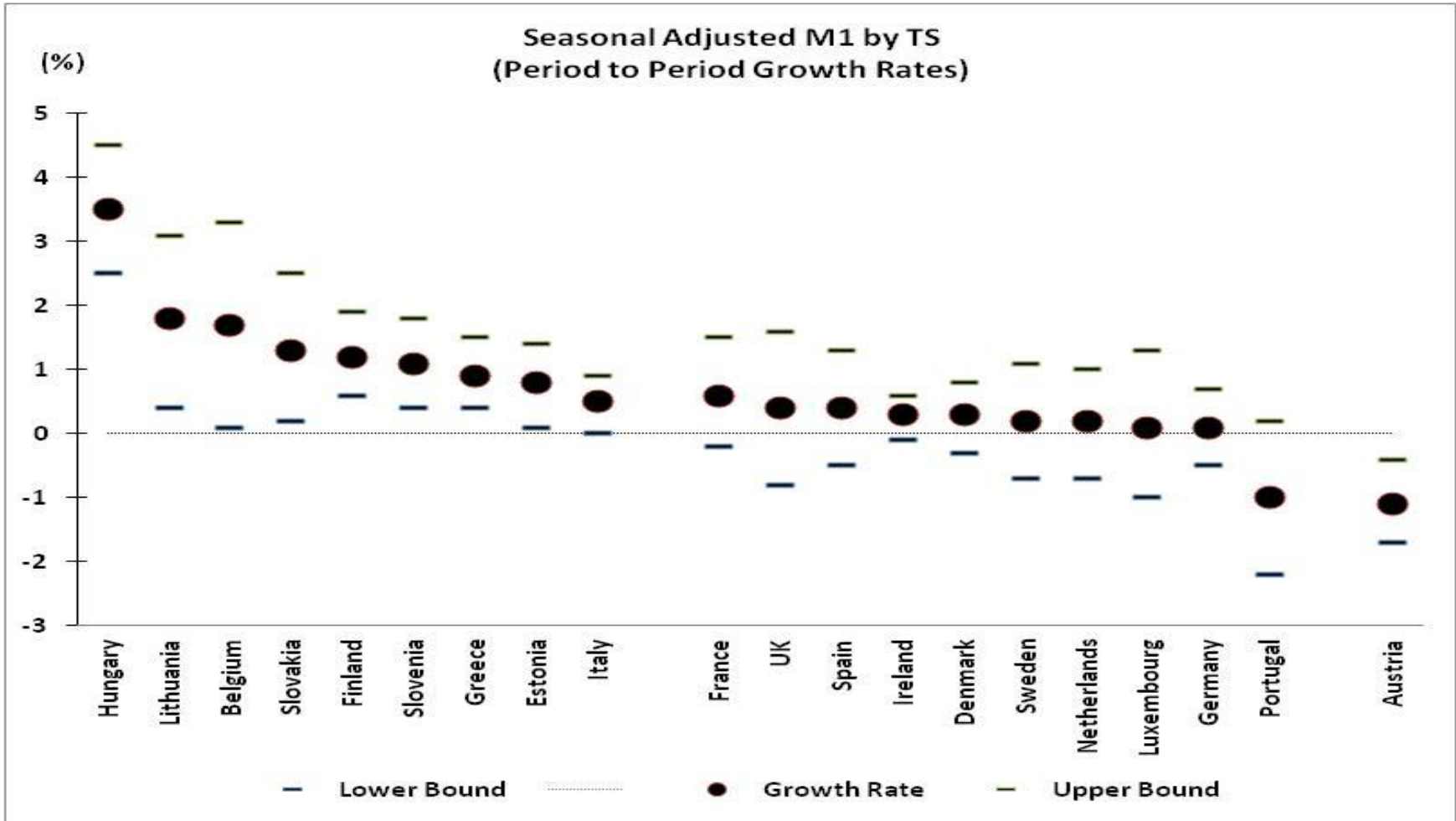
Comparison on Diagnostics

- For M1 indicator, Latvia and Croatia are omitted from the analysis since there is not enough observation for modelling. According to results of remaining (26) series, 6 series have no significant seasonality. For these non-seasonal series, PMIC and TS identified same models for 5 of them. For Bulgaria, PMIC identified different model which has lower BIC than TS's.

- Of course, we have to give more attention to the series which have seasonality (totally 20 series). Then, it can be easily said that PMIC has identified completely different models for the series from the TS's models. And, as we expected all models selected by PMIC for seasonal series have lower standard error for period to period growth rate of current data point and over-parameterized. By the way, it is welcome that PMIC is identified the models have lower BIC for 8 of 20 series. Lastly, diagnostic performance of models identified by PMIC completely agrees with the models identified by TS.
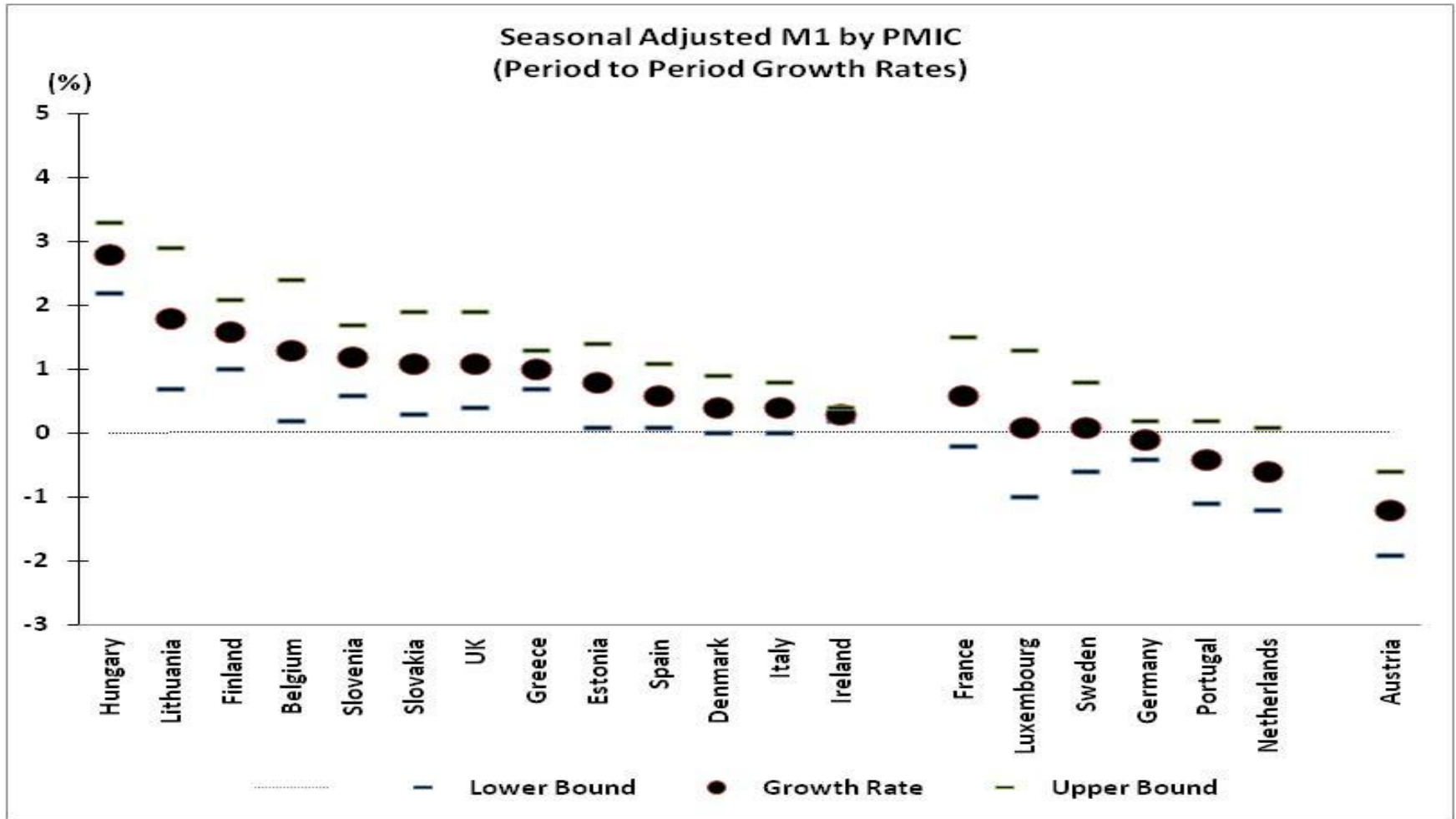
Comparison on Diagnostics (cont.)

- For GDP, all series of 28 countries have enough observation for modelling and have seasonality. It can be easily said that PMIC has identified different models (except for Ireland and Spain) for the series from the TS's models. And similar to M1 results, all models selected by PMIC for seasonal series have lower (equal only for Belgium) standard error for period to period growth rate of current data point and over-parameterized. By the way, it is welcome that PMIC is identified the models have lower BIC for 7 of 20 series. Lastly, it can be said that the diagnostic performance of models identified by PMIC show better that the models identified by TS.
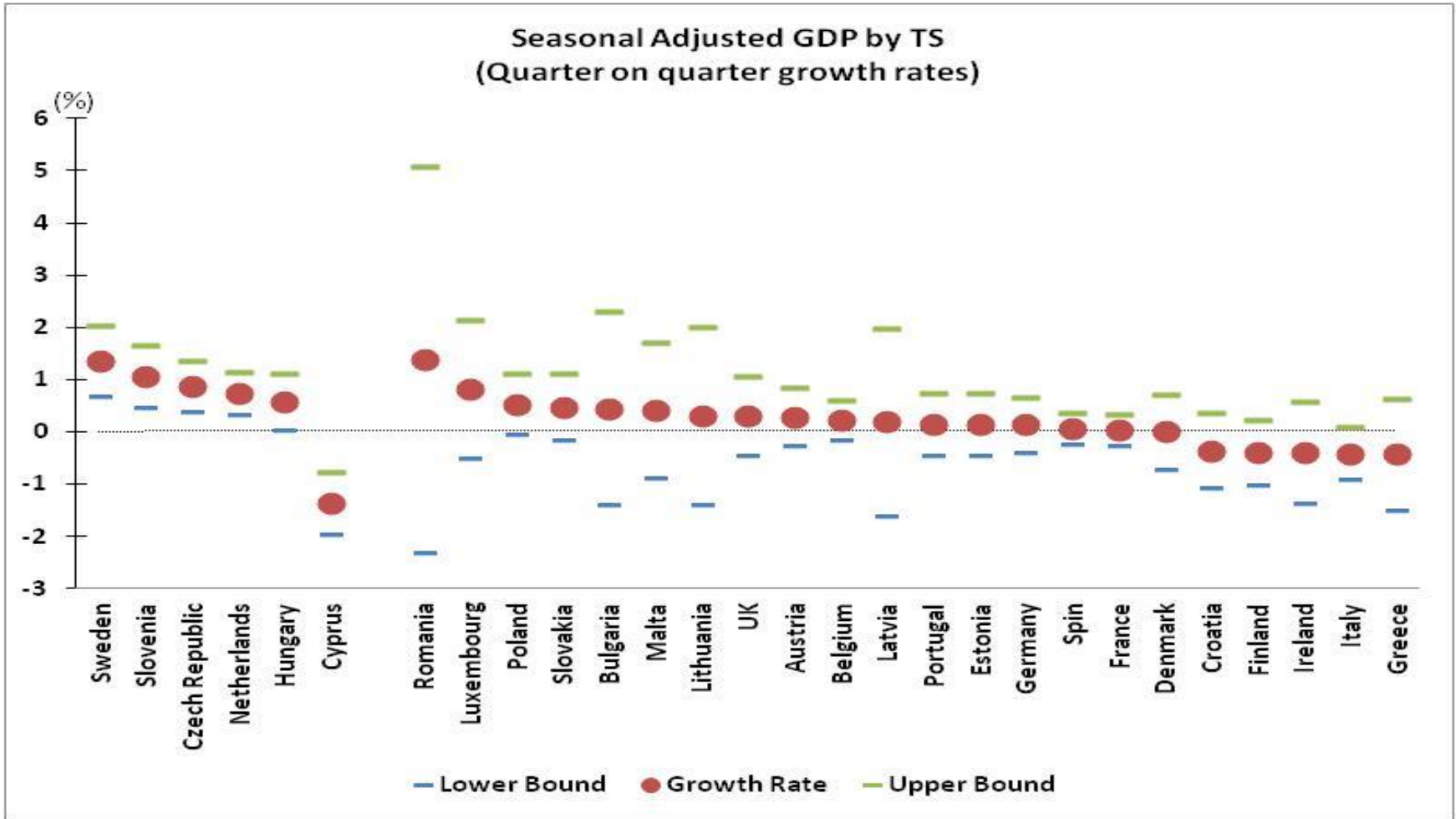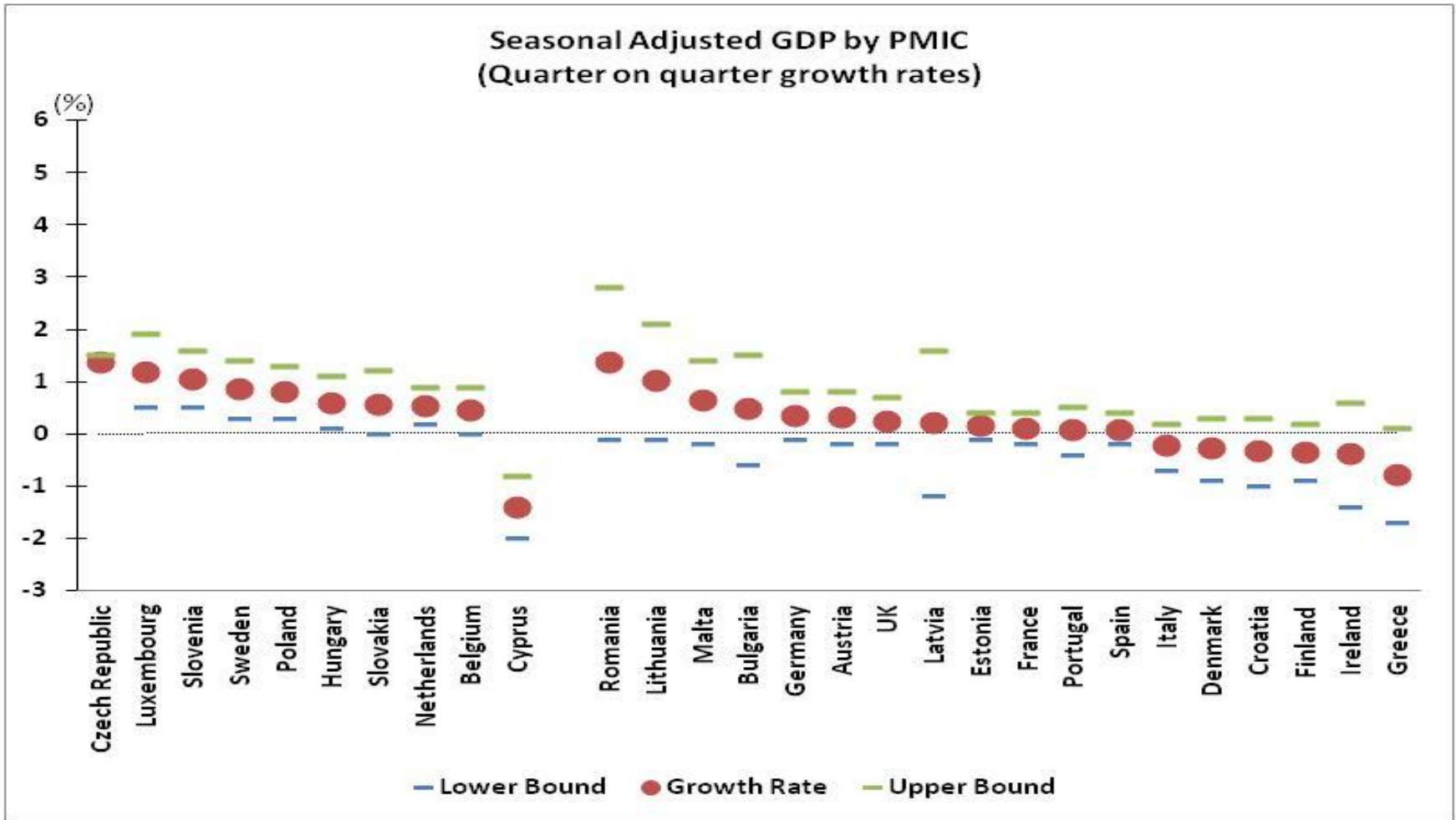
Graphical Comparison

Seasonal Adjusted M1 by TS
(Period to Period Growth Rates)

Graphical Comparison (cont)

Seasonal Adjusted M1 by PMIC
(Period to Period Growth Rates)

Graphical Comparison (cont)

Seasonal Adjusted GDP by TS
(Quarter on quarter growth rates)

— Lower Bound   ● Growth Rate   — Upper Bound

Graphical Comparison (cont)

Seasonal Adjusted GDP by PMIC
(Quarter on quarter growth rates)

Legend: — Lower Bound ● Growth Rate — Upper Bound

Conclusion

- A new criteria (PMIC) is suggested to use in model selection part of seasonal adjustment which use AIC or modified BIC in general. PMIC gives more importance to the precision of growth rate estimates rather than parsimony. Results indicate that PMIC shows good performance to model selection in terms of not only minimization of confidence interval but also fine tuning of classical model based diagnostic. As a practical conclusion, a number of countries' M1 and GDP growth rates are more interpretable and become more significant for the policy makers.

Next steps…

- Trend-cycle estimates
- Year on Year growth rate