

Implementation of Density Forecasts and Macro-at-Risk Approaches

Project description and objective(s)

The macro forecasting process adopted by the Central Bank of Malta, is designed to produce macroeconomic projections to be used as inputs to the ECB's Broad Macroeconomic Projection Exercise (BMPE) and Narrow Inflation Projection Exercise (NIPE) and to the Bank's regular projections.

Macroeconomic and inflation forecasts are conditioned on a set of technical assumptions which the European Central Bank (ECB) transmits to all euro area national central banks in the context of the BMPE and NIPE. These assumptions are fed to a traditional in-house macro econometric model, STREAM, which is then used, in conjunction with expert judgment (derived from formal industry contacts, conjunctural analysis and satellite models, including BVARs, and DFM) to provide a set of point-forecasts. The treatment of risks to projections is currently qualitative as the Bank has no formal toolkit designed to analyze the distribution of projections.

A quantitative assessment of risks to the economic outlook play an important role in both economic policy and private sector decisions. Lately, policy institutions are stressing the importance of having a structured and econometric-based approach to the treatment of risks of macroeconomic projections.

This project aims at filling this methodological gap by developing a toolkit able to accurately estimate the risks surrounding the Bank's projections and to account for the considerable volatility and the significant data revisions affecting the Maltese data.

Main tasks

The selected candidate will be responsible for:

- The development of quantile regressions with the objective of augmenting the point estimate forecasts of the Bank with time-varying risks around macroeconomic forecasts.
- Providing forecasts of quantile estimates and fitting flexible smooth distributions to obtain full probability distributions (in line with the approach of Adrian et al 2019).
- Providing a forward-looking assessment of uncertainty and capture any asymmetries in risk especially over the course of the business cycle.
- Developing tools that are tractable and flexible to be used periodically by the Economics Analysis Department to augment their projections.
- Time-permitting, provide an overview of a number of toolboxes currently being developed at the ECB for augmenting point forecasts with density forecasts and macro-at-risk considerations. In this case, the participant will be tasked with implementing a toolbox on Maltese data and internalize any modifications that would be required in view of Maltese data specificities.

Project-specific requirements

Candidates applying for this project are expected to be familiar with quantile regressions and Macro-at-Risk literature. Preference shall be given to candidates that have already developed risk forecasting models and regressions.

References

Adrian, T., Boyarchenko, N., Giannone, D. (2019). Vulnerable Growth. American Economic Review 2019, 109(4): 1263–1289.

Contact details for questions

E-mail address: phdinternship@centralbankmalta.org