12th ECB Conference on Forecasting Techniques: 'Forecasting@Risk'

Opening Remarks

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Good morning, Ladies and Gentlemen. Welcome to the 12th ECB Conference on Forecasting Techniques. I am honoured to open the conference and very happy to see that the conference can happen in a hybrid format.

This edition, with the title Forecasting @ Risk, brings together experts from academia and policy institutions to exchange new ideas on some of the main current challenges faced by forecasters including the modelling of economic dynamics and the assessment of risks after crises or extreme events.

Why this title? After all, the 9th conference was on "forecast uncertainty", the 11th conference was on "forecasting in abnormal times". I am sure the organisers had a hard time to find a good title after the last one, because the world has not got closer to "normal" since then.

On the contrary, we currently face instability of various nature and forecasting has become even more challenging. Major shocks with specific dynamics have occurred one after the other, during which the ECB also went through a large process of review of its strategy based on the main assumption that low inflation was there to stay. This picture has obviously reversed!

Now, you might have noticed that every time crises arise, models and forecasting tools come under big scrutiny, certainly (and understandably) by the society at large, but sometimes (and perhaps more surprisingly) also by policymakers themselves. And to cope with high uncertainty some people (including policymakers) may believe that we can leave models aside and trust only our judgment or our economic 'instinct', and that this is the best way to navigate through a storm.

It is indeed true that, calibrated or estimated on 'historical regularities', models have hard time to reconcile those regularities with extraordinary developments, possible structural breaks in the data, unprecedented socio-economic or geopolitical events. For these events the past, though similar, might not be useful to inform the models under new circumstances.

But let's be bold and say it loud and clear: Models, although with limitations, are essential to discipline our judgment (no matter how good this judgment is), and to produce any credible macroeconomic forecast. In special times, of course, we need to adapt the way we use models, we might need to rapidly adapt models themselves, and we cannot rely only on baseline or point forecasts, but we need to produce risk indicators around the projection baseline and quantify the uncertainty around this baseline with alternative scenarios. A comprehensive characterisation and proper assessment of macroeconomic risks is important for a timely and effective conduct of the monetary policy. In fact, during the COVID pandemic, instead of publishing the usual point forecasts, the ECB has published scenarios under possible alternative assumptions, in 'what-if' type of experiments, that although designed by wise judgement, only models are able to quantify accurately.

So, make no mistake: models and tools that allow us to give such a comprehensive picture around baseline projections are more important than ever. Especially during crises times, to guide our instinct, to quantify uncertainty, and to attach risks to the projections. Therefore, this

conference hosted at the ECB is much welcome because it is timely, relevant, and important for policymakers.

Econometric methodology is developing rapidly around these concepts. Large data sets and the adaptation of ideas from machine learning provide major stimulus for this. Several new ideas have come up to cope with large shocks and with time variation and at the same time to exploit large data sets. One development is the @ risk literature, namely the idea that the economy behaves differently after extreme events or at the tails of the distribution.

Economic variables are subject to extreme events that are poorly captured by gaussianity or linearity. For instance, when macroeconomic models typically assume that economic disturbances follow a normal distribution, they systematically underestimate the frequency of large economic downturns. Several factors could explain deviations from the normal distribution. These might include financial frictions, sectoral shocks, the zero lower bound on nominal interest rates, spikes in uncertainty, natural disasters, and government policies.

This is extremely important for policy design. The ECB has been taking this up and now includes various chapters on risks into its GC briefing documents that are based on quantile regressions and related risk-analysis tools, thanks also to the work of an Expert Group on Macro-At-Risk (EGMAR) by the ESCB Working Group on Econometric Modelling (WGEM) and the Working Group on Forecasting (WGF) (two sub-structures of the MPC) which had the goal to develop a set of tools and approaches to performing and analysing macroeconomic risk assessments in the course of the "policy" conduct at the ECB and ESCBs. The report of EGMAR has been finalised and hopefully can soon become publicly available. I see from the list of contributors that some authors of papers used in the report are here at the conference.

Cross-checking the results of that report and many of the papers presented at this conference, we know for instance that the empirical findings in this literature often point to asymmetric effects of the risk factors, notably financial risk factors, on GDP growth. The predictive power of different financial indices depends on the forecast horizon and country characteristics. For instance, asset prices are informative for shorter time horizons, while sovereign spreads are more significant for the group of emerging market economies. Shocks to monetary policy, credit, and productivity affect disproportionately the lower GDP quantiles with unexpected monetary policy tightening found to increase the probability of very low growth in the short term.

In contrast to the abundance and clarity of GDP growth results, the somewhat scanter research on inflation-at-risk provides mixed evidence on the ability of for instance the baseline quantile regression approach to underpin asymmetric responses to risk factors. Employing a Phillips curve specification also results in a mixed picture on the detection of asymmetries for inflation. All these methods have been found to perform well in an out-of-sample analysis. However, like the empirical findings for GDP, there is considerable heterogeneity across regressors, estimation samples and country groups in the way that inflation quantiles react to business cycle movements, financial conditions, and other global or local risk factors.

The novel contributions included in the program of this conference will very much enhance the EGMAR report on these topics. Glancing at the conference program, a non-exhaustive list of novel applications includes for instance Bayesian non-parametric or Bayesian neural networks analyses, non-linear dynamic factor models, quantile regression with time-varying parameters or time varying volatility, forecasting macroeconomic tail risks in real time with textual analysis, conditional forecasts in large models with hard and soft constraints, variable selection in high-dimensional problems, and of course forecasting inflation and forecast accuracy.

This list brings me to the final words. But before starting the conference I think it is important to spend these last words on structural issues. Understanding asymmetric risks in macroeconomic variables is an important task in uncertain times and this conference will certainly shed light on it. However, understanding risks that have a structural interpretation and are good for building narratives around projections is also an important and perhaps even more challenging task. I believe that the @risk literature on time series provides an excellent starting point to understand determinants of asymmetries, but to understand structural sources of tail risks, policy makers need to use models that allow to disentangle causal relationships while handling nonlinearities at the same time.

The literature has provided different ways of incorporating nonlinearities in current mainstream structural models, such as DSGE models, that can generate asymmetric tail risks. It has focused mostly on financial frictions, although other sources of risk are of similar importance to policy makers, which are typically incorporated as occasionally binding constraints or heterogeneous agents. Asymmetries may also arise when considering other types of nonlinearities such as state dependent Phillips curves, stochastic volatility, or deviations from normally distributed shocks.

Big computational challenges arise when it comes to include the non-linearities in structural models, especially when heterogeneous agents are considered. Many of the current algorithms to solve and estimate nonlinear DSGE models can be applied to small models. However, small models, although they provide sound theoretical guidelines, might not be of practical uses for policy analysis in central banks which typically rely on medium- to large-scale macro models. Therefore, it is still difficult to conclude that DSGE models can be a perfect solution to understand macroeconomic tail risks, until researchers bring new and more efficient algorithms that may make use of better computational power. I hope this conference can also help in this direction, with new computational methods or simply with the idea of suggesting valuable satellite models, given that it is tricky for structural models to incorporate all different sources of risks in one single model.

Now, without further ado, let's start the conference. It is an amazing opportunity to learn about all this directly from the invited speakers and scholars, also with a view to cross-check the tools that we have at the ECB, and to incorporate, update or enhance them with the results of these frontier studies. It is such a privilege to be able to rely on an extraordinary library of methods and data some of which are already being included in our toolkit, while some others will soon be.

Thanks a lot to the organisers who made such a terrific event possible and possible onsite. I am looking forward to learning a lot from the conference and I wish you all an enjoyable and fulfilling experience.