Inflation forecasting and the crisis: assessing the impact on the performance of different forecasting models and methods

By Christian Buelens

Economic agents base many current decisions *inter alia* on their expectation of the future inflation pattern. The views held about future inflation may influence firms' price-setting behaviour or workers' wage-demands, and thereby impact current purchasing power or labour costs. Through its effect on the real interest rate and on inflation risk *premiums*, the expected inflation rate furthermore influences savings and investment decisions. Inflation forecasts and projections are also often at the heart of economic policy decision-making, as is the case for monetary policy, which in most industrialised economies is mandated to maintain price stability over the medium term. Decision-makers hence need to have a view on the likely future path of inflation when taking the measures that are necessary to reach their objective. Yet, while being indispensable to many decision-making agents, forming inflation expectations is generally both complex and costly: indeed, inflation forecasting requires an understanding of economic relationships, econometric modelling tools, access to data and other information.

This paper analyses how the financial and economic crisis has affected inflation forecasting in the euro area. More specifically, three groups of inflation forecasting models (rules of thumb and benchmark models; autoregressive moving average (ARMA) models; autoregressive distributed lag (ADL) models) are evaluated under a direct and an indirect approach, respectively. Under the former, the models directly forecast headline inflation, while under the latter, component-specific forecasts are generated first and subsequently aggregated to obtain an indirect forecast of headline inflation. The models are simple but representative illustrations of the more sophisticated models that are often used in practice by forecasters.

The paper's first objective is to compare the accuracy of the different inflation forecasting models and methods. Regarding the direct models, it finds that ARMA-models (specified by a penalty function) generally perform at least as well as econometric benchmark models or simple rules of thumb. Adding exogenous explanatory data to the models (ADL-models) in many cases improves the forecast precision further. These improvements have been particularly large during the crisis period. As far as the indirect approach is concerned, the forecasts are generally at least as accurate as those generated by the direct method. However, the magnitude of the gains depends much on what precisely is being aggregated. It is only
once appropriate specifications for the component-specific ARMA or ADL-models have been found, that the indirect forecasts dominate the corresponding direct model. Indirect forecasts perform best when the information set is widened, allowing different exogenous explanatory variables to enter in each component-specific model. It should however be noted that in the pre-crisis period the best indirect forecasts only marginally outperformed the best direct forecasts, and that this was partly due to the strong conditioning assumptions. Yet, even if a systematic superiority of the indirect forecasting approach would be difficult to assert on the mere basis of the results of this paper, its use in practice nonetheless seems fully warranted and justifies further work on the refinement of component-specific models.

An important lesson from the economic literature has been that the forecasting accuracy of models is sensitive to the period in which they are estimated and evaluated, and that conclusions regarding their merit may consequently be short-lived. The second objective of the paper has been to illustrate this time-sensitivity and to gauge the impact of the crisis by repeating the comparative assessment over two different sample periods. The across-the-board rise in the forecast errors of all models considered confirms that inflation forecasting has become substantially more difficult after the onset of the crisis. However, the deterioration of the different models has been uneven: in general, the performance of slightly more elaborated models and in particular of indirect forecasts, has improved during the crisis relative to simple econometric benchmarks or rules of thumb. Indeed, while the model comparison during the pre-crisis period would have backed the conclusions of earlier studies emphasising the virtues of simple models – including the central bank’s inflation target – the comparative evaluation during the crisis would cast doubts on those very same conclusions.