

ECB Workshop: Forecast Uncertainty in Macroeconomics and Finance

**Discussion of “Model selection and forecast
comparison in unstable environments”
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Introduction

The forecast uncertainty considered in this paper is uncertainty about the choice of model in an unstable environment.

Instability is defined very generally, and may result in the relative performance of the (two) competing models changing over time.

Point forecasts are the focus, not interval forecasts or density forecasts.

Tests are based on moving windows/rolling subsamples of the data, both in-sample and pseudo-out-of-sample.

I have some brief comments on the details of the set-up and the empirical application, and some suggestions about possible extensions.

The selection criterion

Relative goodness-of-fit is measured by the sample estimate of the KLIC difference:

$$\Delta KLIC_t = E \left[\log f_t(\theta_t) - \log g_t(\gamma_t) \right].$$

This is equivalent to the loglikelihood ratio (Bao, Lee and Saltoglu, 2003, 2007) and the difference in logarithmic score (Amisano and Giacomini, 2004, 2007).

A normal density is assumed:

- this is conventional in macroeconomic modelling
- but asymmetric variants are used in macroeconomic density forecasting
- and skew, kurtotic distributions in modelling and forecasting in finance
- BLS use a semi-nonparametric form which nests the normal distribution

The moving window

More care is needed in indexing:

- with sample size T and window size m there are $T-m+1$ possible windows
- so the stated range of the window index t is one short
- plots are shown with the selection criterion calculated at points $1, \dots, T$

Guidance on the choice of m (or $\mu = m/T$) would be helpful:

- the asymptotics assume constant μ as m and T increase
- how to evaluate the implicit trade-off: the smaller is m , the quicker is the detection of change but the greater is the noise level

The empirical application

The SW (2003) DSGE model of the euro area is not a forecasting model, nor do its authors make any such claim:

- claims about its comparable performance to VARs, cited by the present authors, are based on marginal likelihood comparisons
- but the DSGE model does not beat the VARs on in-sample RMSE for any one of its seven variables
- we might often wish to allow for different numbers of estimated coefficients in competing models, by calculating AIC, BIC, Hannan-Quinn criteria, ...
- how do we do this for calibrated models?
- in practical forecasting, the filtered data used to estimate the competing models in the present exercise would need to be “re-coloured”

Possible extensions of interest to forecasters

- (1) consider genuine forecasting models
- (2) consider an alternative approach, given competing models/forecasts, namely forecast combination:
 - several model selection tests can be constructed in a combining/encompassing framework
 - an alternative criterion in the face of instability could be the stability of the combining weights
- (3) consider an alternative environment, with more numerous and better-documented changes of regime

In the UK, combinations of narrative and econometric analysis have identified:

- two subperiods, pre- and post-1980:
 - Haldane-Quah (1999): Phillips curve vertical/horizontal
 - Nelson-Nikolov (2004): NK model, “monetary policy neglect” pre-1980
 - Nelson (2007): “overhaul of doctrine”
- four subperiods (Benati, 2004): extreme instability (1970s); remarkable stability (post-1992); two “in-between” periods (Bretton Woods, 1980s)
- five policy regimes (Meenagh *et al.*, 2007): Bretton Woods, to 1970:4; incomes policy, 1971:1-1978:4; money targeting, 1979:1-1985:4; exchange rate targeting, 1986:1-1992:3; inflation targeting, 1992:4-

(estimated break dates in a 3-variable VAR are always slightly later)

Additional references

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