

Norges Bank Nowcasting Project

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October 2007

Introduction

- Most CBs combine (implicitly):
 - Structural macro models (often large) to capture impact of policy variables on targets
 - Less structural “nowcasting” models which provide information on current state of business cycle
- Typically, “nowcast” information fed into structural model as starting values – as data – go h -steps ahead, where $h < 5$

Nowcasting Issues I

- How many and what models should go into the nowcasting system?
- How should nowcasting forecasts be combined?
- How should the nowcast and the structural forecast be reconciled?
- How should judgment be applied to the forecast (at shorter horizons)?

Project Overview

- Redevelopment of NB nowcasting system
- Phase I aim: build human capital in nowcasting techniques commonly used by CBs, generate models
- Phase I outputs: several working papers (now writing up) and models suitable for NB forecasting

Project Overview, Phase II

- Phase II (to June 2008, Forecast Evaluation) aims:
 1. Develop and evaluate the Norges Bank portfolio of short-term forecasting models
 2. Scope options for production of a “front-end” suitable for regular policy use by non-specialists
- Phase II outputs:
 1. “Finalized” system of models for nowcasting (subset of Phase I models)
 2. Internal paper describing options for the “front-end”

Project Overview, Phase III

- Phase III (to June 2009, System Implementation) aims:
 1. Implement “front-end” suitable for regular policy use by non-specialists
 2. Prepare for future external evaluation of Norges Bank modelling (Nowcasting plus NEMO)
- Phase III outputs and resources decided early 2008

Some International Benchmarks

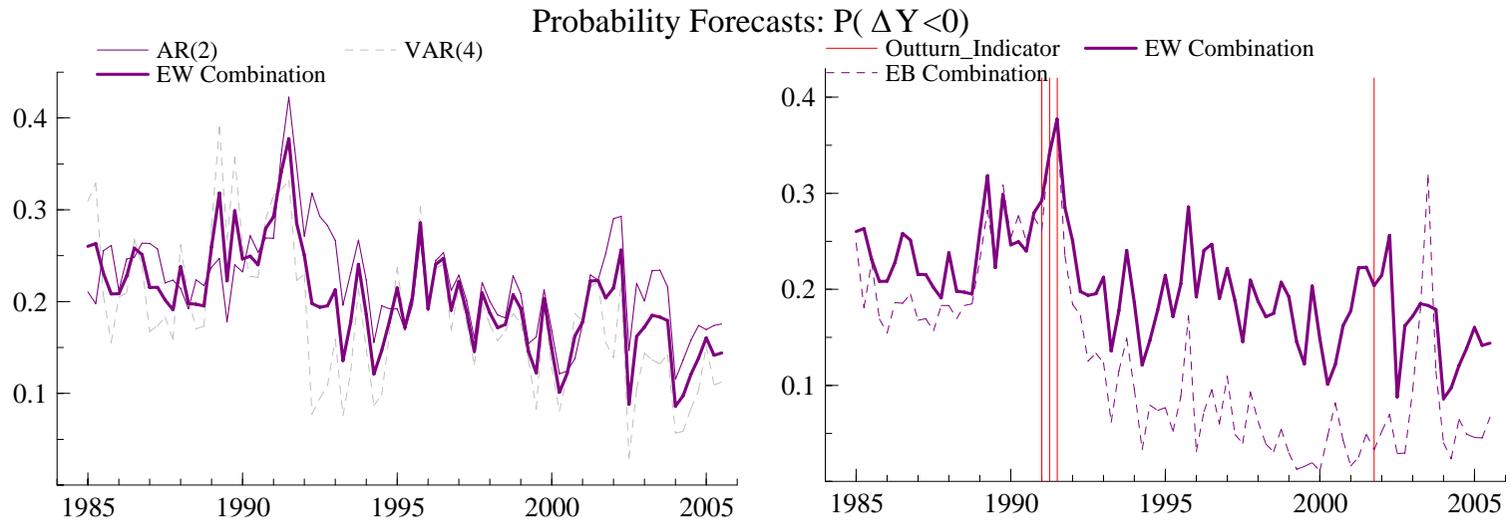
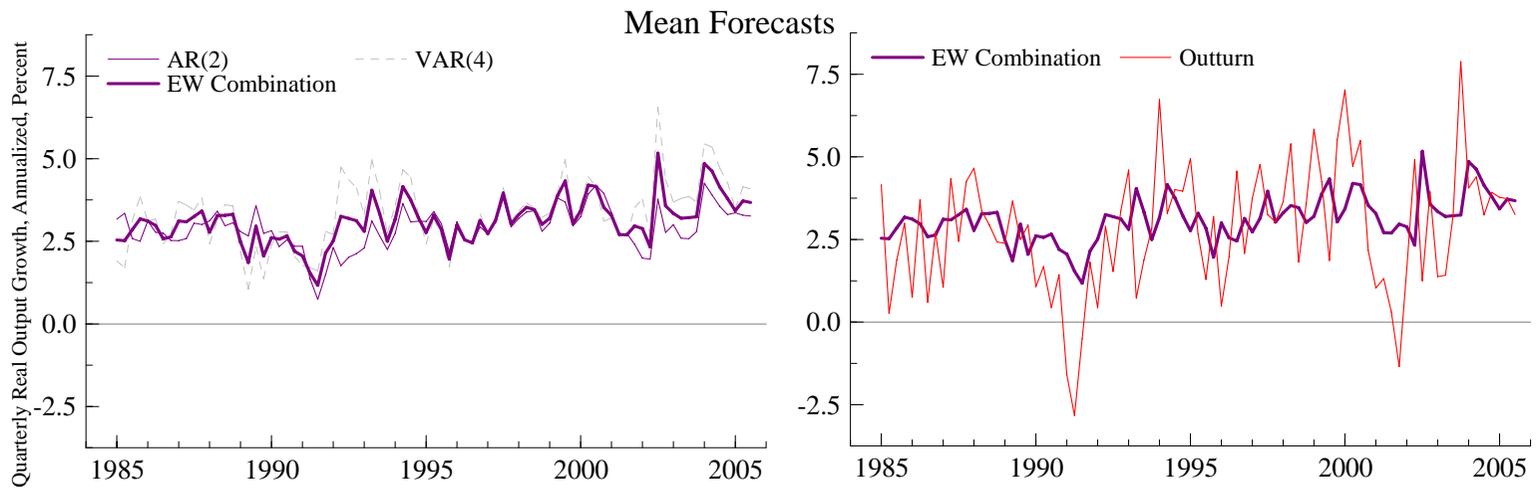
- Andersson and Lof, “The Riksbank’s new indicator procedures”, Economic Review 2007/1, describes the Swedish nowcasting system
- Kapetanios, Labhard and Price, “Forecast combination and the Bank of England's suite of statistical forecasting models”, working paper 323, 2007
- Nowcasting Workshop held at NB in June

The Norges Bank Nowcasting Framework: “The Bucket”

- Recast each “model technology” as an Expert
- Each Expert produces h-step ahead forecast densities for output, prices, interest rates
- Consider decision-maker, DM, evaluates Experts’ densities by out-of-sample log score, RMSE, Info Criteria
- DM produces combined densities by linear opinion pool method; see eg Winkler (1981), Wallis (2005), Mitchell and Hall (2005)

Expert #1: Averaging VARs

- People: Anne Sofie Jore, James Mitchell (NIESR)
- Extend Clark and McCracken (CM, 2007, JAE) to average density forecasts, rather than point forecasts
- “Combining Forecast Densities from VARs with Uncertain Instabilities”, CIRANO real-time workshop October 2007
- Central finding (US data) : simple averages produce poor density forecast - need TVP/breaks



Expert #2: DSGE-VAR

- People: Leif Brubakk, Junior Maih, Ida Wolden Bache
- Extend Del Negro and Schorfheide (2003) to consider density forecast performance of NEMO-sized DSGE-VAR
- “Does Adding the Structure of NEMO Improve VAR Forecasts?”
- Central finding: size matters!

Expert #3: Factor Models

- People: Knut Are Aastveit, Domenico Giannone (ULB, ECB), Tørres Trovik
- Extend Giannone et al (2007, JME) to generate predictive densities for Norwegian output gap
- “Nowcasting Norwegian GDP: The Role of Asset Prices in a Small Open Economy”
- Main finding: Nowcasts substantially improved by using intra-quarter information, asset prices are key

Expert #4: VECM

- People: Roger Hammersland, Anthony Garratt (Birkbeck College)
- Extend Garratt et al (2007) to predictive likelihood VECM system, probabilistic assessment of real-time forecast accuracy using VECM as benchmark
- “A Bayesian Information Theoretic Indicator of Real-time Forecast Accuracy”
- Main finding: convenient tool uses SBC to provide model weights - pre-test and nested-test problems are gone

Expert #5: Disaggregate Models

- People: Bjørn Naug, Francesco Ravazzolo
- Forecast densities for disaggregate components of the CPI, combining evidence from disaggregate data by (i) 40-50 goods-services and (ii) 11 delivery sectors
- AR models allow for many unknown structural breaks, like Clark (2006), but use predictive likelihood break dating (allowing for variance breaks)

Related Papers in Progress

- Jore, Mitchell, Nicolaisen and Vahey (2007) consider linear opinion pool combinations of DSGE models and a Clark-McCracken style average VAR system
- Lees, Mitchell and Vahey (2007) present the DM's Expert combination problem and use it to analyse event forecasts produced by a small (NZ) DSGE-VAR, based on Lubik-Schorfheide (2006)

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Nowcasting Issues II

- How many Experts should we have? And should they spread the model risk?
- We find the Experts-DM linear opinion pool approach helpful to combine densities, but are there others?
- We are exploring DSGE-nowcast combinations that treat the nowcast as data, could entropy methods could be used?
- Currently exploring judgment-free nowcasts, but should we add judgment to those? And how?

Central Ideas

- Nowcasting methods are under development with international visiting scholars (Christie Smith, RBNZ, Hilde Bjørnland, BI, will visit in 2008-09)
- The Experts are “best practice” in central banks; see Goodfriend et al (NB Watch No 8, 2007)
- Some Experts should help policy later this year
- Density combination system kick off in 2009