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


• Nowcasting Workshop held at NB in June

- 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
### Mean Forecasts

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### Probability Forecasts: P(ΔY<0)

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### Outturn Indicator

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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)
Nowcasting Issues I

- How many and what models should go into the nowcasting system?
- How should nowcasting forecasts be combined?
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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