

How to improve the use of models for monetary policy

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Projections for monetary policy - key issues

What are the key challenges when preparing projections for monetary policy?

- 1 Constructing a forecast with a suite of models *and judgment*
- 2 Thinking about (optimal) policy around that forecast in a consistent way

Suite of models

- **Models are maps** that we use to help us think in a structured way about the economy.
- Different models → different features and **different purposes**.
- Topographic maps, cadastral maps, political maps, etc... Similarly, different models are most useful for different purposes, e.g.
 - structural models for policy analysis and scenarios
 - time series models for forecasting and monitoring macroeconomic conditions
 - projection/semi-structural models

Suite of models

- Central banks naturally use different models to harness the strengths of each model,
- but this raises the issue of how achieve **consistency and compatibility across models** and their narratives
- ...and there always is something that is not fully captured by the models, so **judgment is crucial!**

Suite of models - the trade offs

Different central banks have different types of models as organising frameworks (e.g. DSGE or semi-structural) and different compositions of the suite, but all face the same trade-offs.

- Theoretical consistency of the central model **vs** Flexibility in modifying the model and adding judgment
- What goes in the central model **vs** What goes in model suite
- Consistency/compatibility across models

So research/development work has gone into all these issues

Consistency across models

- Structural/scenario analysis generally done with structural models (mainly DSGEs, but also SVARs)
- monitoring macroeconomic conditions (Factor models, etc...)

Is it possible to use a common framework for structural/scenario analysis and monitoring macroeconomic conditions?

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- Structural/scenario analysis generally done with structural models (mainly DSGEs, but also SVARs)
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Is it possible to use a common framework for structural/scenario analysis and monitoring macroeconomic conditions? Yes.

- real-time high frequency analysis with DSGE model in **Giannone, Monti, Reichlin (2016)**
- ... and with an SVAR in **Cimadomo, Giannone, Lenza, Monti, Sokol (2021)**

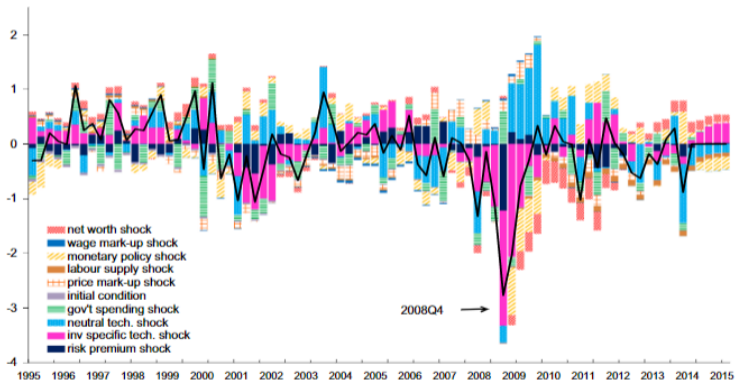
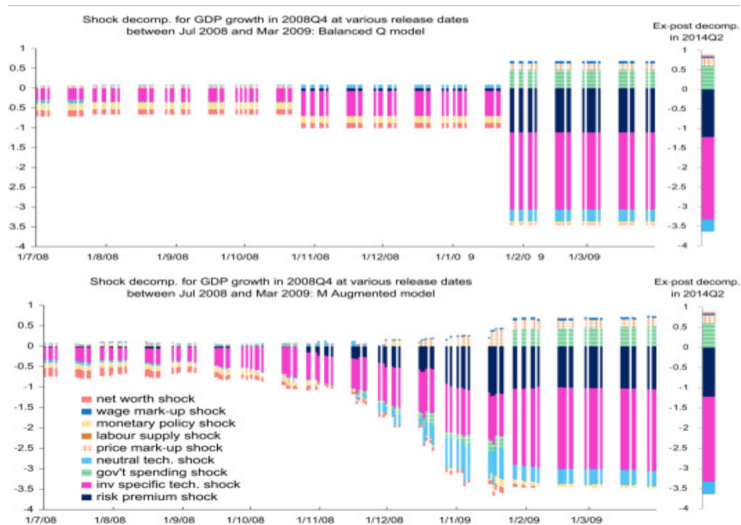
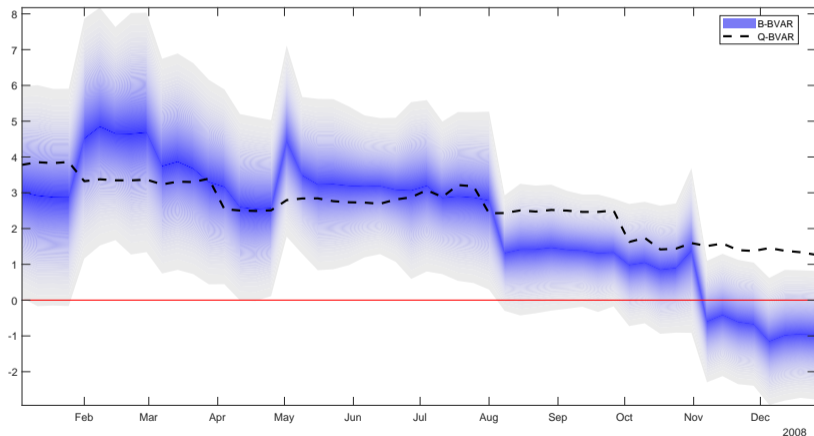


Fig. 1. Shock decomposition of quarterly GDP growth. (For interpretation of the references to color in this figure caption, the reader is referred to the web version of this paper.)

Giannone Monti Reichlin 2016



Counterfactual Fed Funds rate in 2008Q4



Forecasting with judgment

- Judgment still remains a crucial part of the forecast.
- Judgments come in at various stages of the process:
 - on assumptions
 - on short-term outlook propagation
 - scenario-type judgments
- Especially when starting from the previous baseline forecast, accounting for judgment from one round to the next is tricky

Forecasting with judgment - some research

- **Monti (2010)**: Formally combine forecasts generated by structural models and judgmental forecasts to improve the forecasting performance of the model
 - Allows interpreting the judgmental forecasts through the lens of the model.
 - assess the informational content of the judgmental forecasts.
- **Caldara, Harrison and Lipinska (2014)**: analyze the propagation of shocks originating in sectors that are not present in the central model, proxying the missing sector through a small set of factors, that feed into the structural shocks of the central model to create correlated disturbances.
- **Gelain and Manganelli (2020)**: incorporate central bankers' judgmental decisions in state of the art macroeconomic models.

Optimal policy projections

In my (possibly dated) experience at the Bank of England OPPs extremely useful. Great starting point for really talking about monetary policy around the forecast. Also used in speeches (e.g. Carney, 2017, and Tenreyro, 2018).

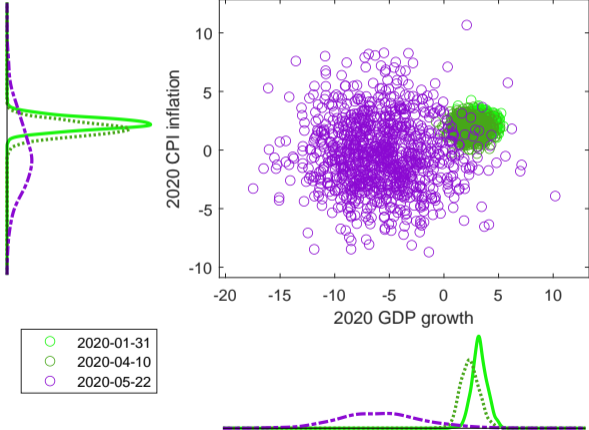
- **Harrison and Waldron (2021)**: toolkit for optimal policy analysis, subject to occasionally binding constraints on (multiple) policy instruments and other variables. Allows for optimal policy analysis around judgement-based forecasts .
- **de Groot et al. (2021)**: Very similar, but does not require a fully specified structural model, merely a baseline path for the variables in the policymaker's loss function and impulse responses of those variables to changes in the paths of the policy instruments.

Incorporating risk assessments in the forecast

Crucial to enhance the risk analysis around the forecast.

- Methods like entropic tilting can help bring insights from judgmental forecasts for all moments: e.g. **Galvao, Garratt and Mitchell (2021)**
- **Sokol (2021)**: conditional quantile regression (CQR), that generates density forecasts consistent with a specific view of the future evolution of some variables.
- Use models that can characterise the uncertainty around the forecast and how it is affected by incoming data: e.g. **Cimadomo et al. (2021)**

Cimadomo et al.(2021)



Final Observations

- Practical aspects!
 - Envisage staff for maintainance of code and models
 - Staff incentives are crucial
- Model development
 - My view: wider suite better than a more complex central model
 - **Beware the model creep!**

Final Observations - Model creep

"What a useful thing a pocket-map is!" I remarked.

"That's another thing we've learned from your Nation," said Mein Herr, "map-making. But we've carried it much further than you. What do you consider the largest map that would be really useful?"

"About six inches to the mile."

"Only six inches!" exclaimed Mein Herr. "We very soon got to six yards to the mile. Then we tried a hundred yards to the mile. And then came the grandest idea of all ! We actually made a map of the country, on the scale of a mile to the mile!"

"Have you used it much?" I enquired.

"It has never been spread out, yet," said Mein Herr: "the farmers objected: they said it would cover the whole country, and shut out the sunlight ! So we now use the country itself, as its own map, and I assure you it does nearly as well."