

Bringing policy models to practice: issues and challenges

Hernando Vargas
Banco de la República
Colombia
January, 2015

Banco de la República' s experience with monetary policy macro models

- First attempts to develop dynamic macroeconomic models around 2000 (after the BoE example)
- First fully-working, small semi-structural model for forecasting and policy guidance in place by 2004
- DSGE model for forecasting and policy guidance in use since 2009
- Several special-purpose DSGE models developed over the past 4 years (financial channels and macroprudential policies, labor markets, FX intervention, fiscal policy, commodity sectors etc.)
- Dedicated team: Macroeconomic Models Department:
 - Development and maintenance of macro models
 - Participation in Inflation/Macro forecasting quarterly rounds (Key!)
 - Addressing specific questions and issues posed by the Board and Senior Staff
 - Development of statistical/analytical tools for special purposes

Main Uses of Macro Models in BR

- Forecasting/Policy Guidance
- Analysis of effects of shocks and policy responses in a general equilibrium framework
- Understanding of macroeconomic concepts (e.g. natural output, natural interest rate etc.)
- Enhancement of Central Bank technical capability/
knowledge generation

Forecasting/Policy Guidance

- Presumably, the main use of these tools
- Overall Performance: Good
 - Means to tell a **consistent** story about the behavior of the economy through time
 - Perhaps more importantly... Models induce both Board and Staff to think of the economy in **general equilibrium**
... and focus the attention on the **exogenous shocks** buffeting it, their origin (persistence and correlation) and future path

Forecasting/Policy Guidance

- Drawbacks and challenges:
 - Usefulness is reduced in a small economy subject to large and **diverse shocks** ...
 - ... Simple, standard, workable models cannot capture all salient features of the economy that are relevant for very different shocks ...

Examples:

- Financial channels prior and after the Global Financial Crisis (credit booms/retractions)
- Fiscal and macroeconomic implications of **permanent shocks** ... E.g. Oil today

Forecasting/Policy Guidance

- Drawbacks and challenges:
 - Not only are relevant channels missing, but also **alternative policy tools** are sometimes absent

Examples:

- Specific Macroprudential tools: Gap between "generic" lending rate "surcharge" present in models and available policy measures (reserve/liquidity requirements, capital requirements, provisions etc.)
- Fiscal policy tools (different taxes and types of public expenditure)

Monetary policy responses are sometimes conditioned, complemented or substituted by those policies ... Key for decision making

Forecasting/Policy Guidance

- Drawbacks and challenges:
 - The mapping from the shocks captured by the models (e.g. in an exercise of historical decomposition of shocks) to what analysts are observing in reality is far from straightforward

This is in part related to the previous point of models being too simple to reflect large and diverse shocks hitting the economy

It is however a useful exercise to inform and discipline the analysis of the economy, ...

... since a presumed shock must be identified on the basis of its expected effects on observable variables

Analysis of effects of shocks and policy responses in a general equilibrium framework

- Perhaps one of the most productive uses of DSGE models in my experience: Simulations or "experiments" not necessarily linked to the forecast
- Useful to track the effects of individual shocks throughout the economy and to understand the workings of the models
- In the regard, helpful to inform discussions about effects of shocks and policy responses in a model with Colombian parametrization

Example: What is the effect of monetary policy tightening on the current account balance?

Understanding of macroeconomic concepts (e.g. natural output, natural interest rate etc.)

- Policy discussions on the appropriateness of a monetary policy response depend on the concepts and the models that policy makers use to understand the economy
- This is the case of potential GDP ... It may be understood as trend GDP or as the "flexible-price" level of GDP ... With very different implications in the presence of "supply" shocks
- Models have been useful to illustrate these issues and inform policy decisions
- Also, models have been helpful to deliver the idea that shocks to potential GDP may affect the natural interest rate at the same time

Example: Large investment projects in infrastructure increase potential GDP in the future, but may also raise the natural interest rate today

Enhancement of Central Bank technical capability/ knowledge generation

- Important intangible benefit of Central Bank engagement in model building
 - Model development entails large economies of scale and scope + significant learning by doing

This substantially enhances the ability of Central Bank staff to build new models at a decreasing cost ...

... It also enables the staff to develop and adapt new techniques to macro models or other purposes, as well as to stay close to advances in the academy or other central banks

- Models help focus research on parameters or features of the key channels of transmission of shocks and policies ==> drive and organize knowledge generation.

Conclusion

- Despite their limitations, models have been important to improve the policy-decision process
- Even if their structure do not allow them to reflect all shocks or produce very accurate forecasts, they still force some consistency and discipline in policy discussion
- More importantly, they induce the Board and the Staff to think of the economy in general equilibrium and to understand the shocks it experiences
- They are useful tools to illustrate macroeconomic concepts and inform policy discussions
- Model building greatly enhances the technical capabilities of the central bank