

The Use of (DSGE) Models in Central Bank Forecasting: The FRBNY Experience

Marco Del Negro

Panel Discussion
2016 ECB Workshop on “DSGE Models and Forecasting”

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Are DSGEs of Any Use for Forecasting and Policy Analysis?

ECONOMICS

Economics Struggles to Cope With Reality

174 JUNE 10, 2016 8:00 AM EDT

By [Noah Smith](#)

“... most people outside the discipline who take one look at these models [DSGEs] immediately think theyre kind of a joke. They contain so many unrealistic assumptions that they probably have little chance of capturing reality. Their forecasting performance is [abysmal](#). Some of their core elements are clearly broken. Any rigorous statistical tests tend to reject these models instantly, because they always include a hefty dose of fantasy.”

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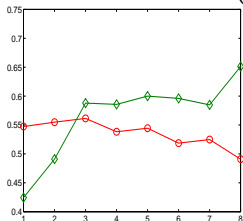
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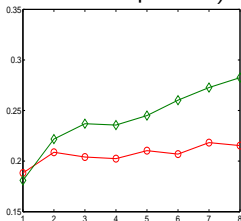
Link to [abysmal](#): Abstract of Gürkaynak, Kisacikoglu, Rossi (Advances in Econometrics, 2013): “... there is no single best forecasting method. For example, typically simple AR models are most accurate at short horizons and DSGE models are most accurate at long horizons when forecasting output growth ... ”

Abysmal?

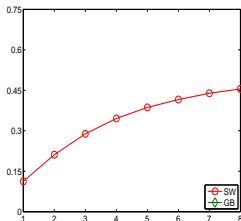
Output Growth SW vs Greenbook (March 1992-Sept 2004)



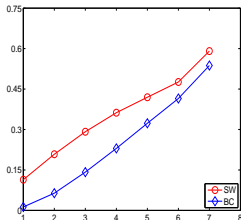
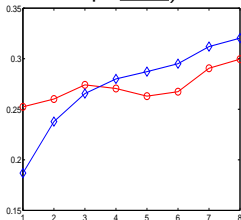
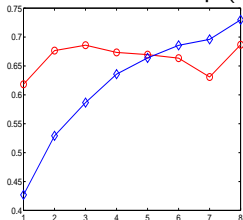
Inflation SW vs Greenbook (March 1992-Sept 2004)



Interest Rates SW vs Greenbook (March 1992-Sept 2004)



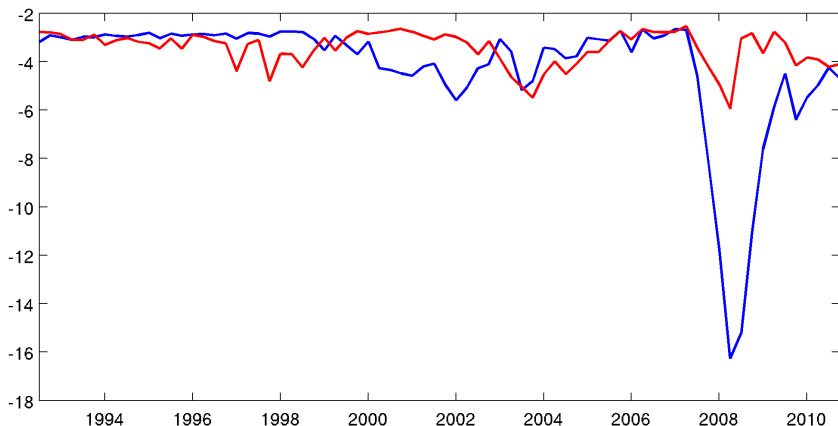
SW vs Blue Chip (Jan 1992-Apr 2011)



Del Negro & Schorfheide (2013) "DSGE Model-Based Forecasting"
Handbook of Economic Forecasting II

Which DSGE Model Anyway?

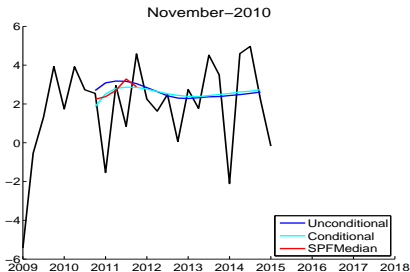
Log Scores Comparison: SW vs SW + Financial Frictions



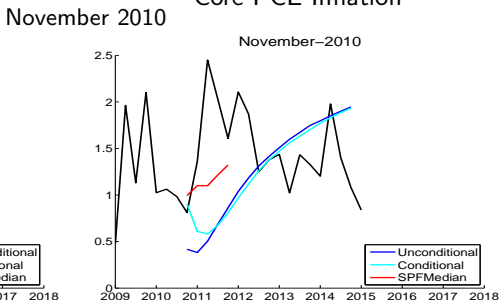
Del Negro, Hasegawa, Schorfheide (2015) "Dynamic Prediction Pools" *JoE*

“Real” Real Time Forecasts from FRBNY-DSGE Model

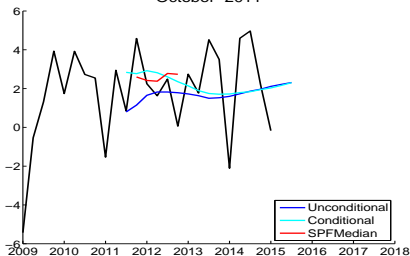
Output Growth



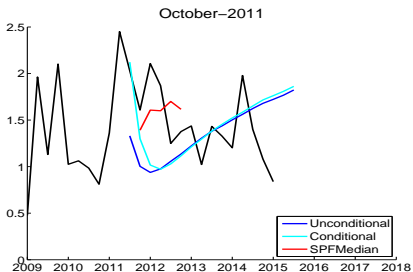
Core PCE Inflation



Output Growth



Core PCE Inflation



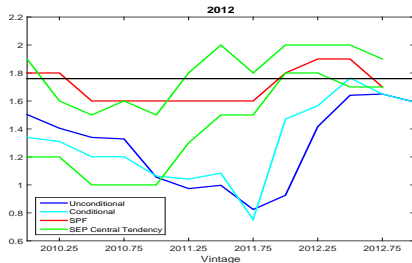
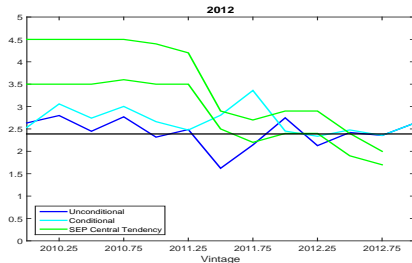
“Real” Real Time Forecasts from FRBNY-DSGE Model

Evolution of year-over-year forecasts

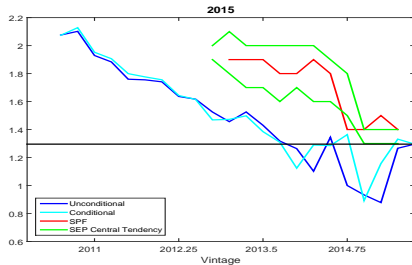
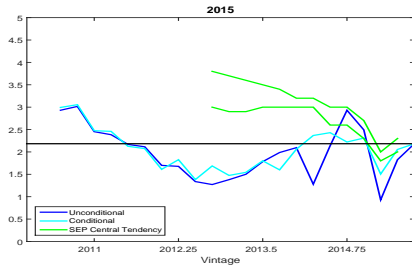
Output Growth (Y-o-Y)

2012

Core PCE Inflation (Q4/Q4)



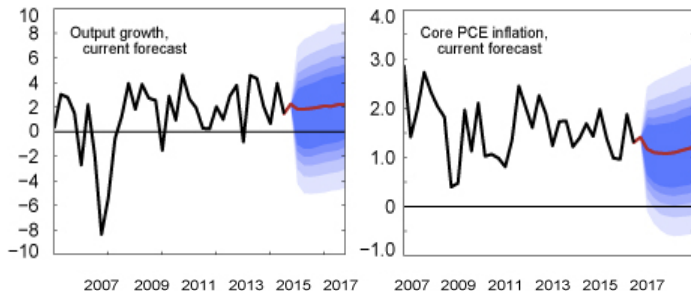
2015



The FRBNY DSGE Model Forecast—November 2015

Marco Del Negro, Marc Giannoni, Erica Moszkowski, Sara Shahanaghi, and Micah Smith

Forecasts of Output Growth and Inflation



Why don't more central banks publish their DSGE forecasts?

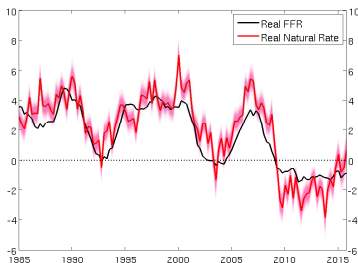
Storytelling, Unobservables, and Counterfactuals

- Yes, DSGEs may produce higher RMSEs than AR(2) ...
- .. But what do we do with an AR(2) (or VAR(2)) for policy analysis?

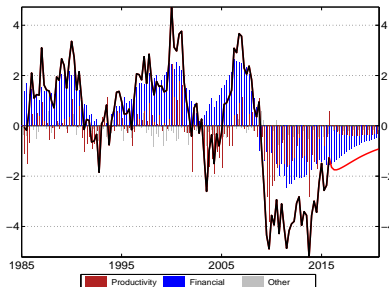
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- DSGEs can produce unobservables, and explain them in terms of the shocks that hit the economy:

Natural Rate of Interest



... and Its Decomposition

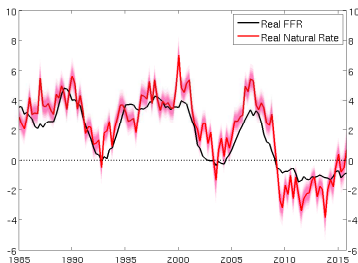


- And, being full-fledged econometric models, can characterize the uncertainty surrounding these objects (unlike Cowles foundation models).

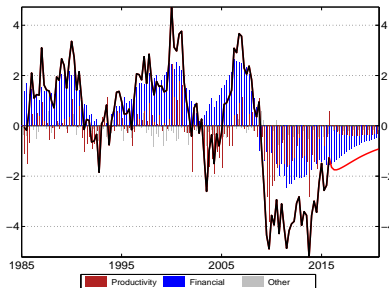
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- And, being full-fledged econometric models, can characterize the uncertainty surrounding these objects (unlike Cowles foundation models). Can we trust the DSGE-implied uncertainty?

Dealing with Misspecification

- Still, critics are right that the DSGEs are currently (and will always be) mis-specified.
- Incorporating misspecification into the policy advice/forecasting is of first order importance.
- What to do? **Diversify**:
 - ① Across DSGEs
 - ② Between DSGEs and other models – either directly embedding the DSGE into a loosely parameterized models (**DSGE-VARs**) or using **pools**
- “Will DSGE models eventually improve enough to fully replace semi-structural models in the forecasting process of the central banks?” Why *replace*?

Only Representative Agents/New Keynesian DSGEs?

- DSGEs are not all the same, but still, most (if not all) are near-clones of Smets and Wouters
- While there are good reasons for this, it is worrisome
 - ① Not enough diversification/too much homogeneity
 - ② Disconnect from academia
- Laundry list of possible avenues: Agents heterogeneity with borrowing and liquidity constraints, financial considerations such as the demand for safe assets, deviations from perfect information/rational expectations ...
- It is not easy – both computationally and econometrically – but let's start walking (as central bank's modelers) along some of these avenues!