

# Macroeconomic Modeling in the Policy Process: A Review of Tools Used at the Federal Reserve Board and Their Relation to Ongoing Research

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These slides present the author's perspective on ongoing research related to macroeconomic modeling. The views expressed herein are solely the author's, and do not reflect those of the Federal Reserve Board or its staff

# Macroeconomic Models at the Federal Reserve Board

- Staff at the Federal Reserve use many “models”:
- No single model “rules the day”, and model results are just one input into forecasting and policy analysis
- A range of models contributes to robustness of policy implications
- Combining structural models with time-series approaches and with judgment ensures that a wide range of factors, and alternative views, enter forecast and policy discussions

# Models Used Routinely in Forecasting and Policy Analysis

- “Structural” macroeconomic models at the Federal Reserve
  - The FRB/US model is a large scale macroeconometric model
  - EDO is an estimated, closed economy DSGE model
  - SIGMA is a calibrated, open economy DSGE model
- Each model has strengths and weaknesses, and, as a result, the models are used for a range of purposes
  - EDO and FRB/US
    - Forecasting:
    - Estimation of the state of the economy – “fundamental” shocks and the state of resource utilization
    - Alternative scenarios and policy analysis
  - SIGMA
    - Alternative simulations and policy analysis

# Other Structural Approaches

- Staff at the Federal Reserve adapt models to address questions of the day
  - Small, “semi-structural” models capturing key relationships that can bring out the intuition behind results (e.g., Fuhrer-Moore (1995), Rudebusch-Svensson (1999) models)
    - Adjusted to address questions as they arise -- such as the effects of quantitative easing (e.g., Kiley (2012))
  - A mix of calibrated/estimated dynamic general equilibrium models
    - With features different from those of EDO and SIGMA, for example
      - Frameworks that incorporate different ways to understand the effects of Quantitative Easing (e.g., Chen, Curdia, and Ferrero (2012))
      - The role of alternative indicators of labor market slack (e.g., both unemployment and labor force participation) in understanding dynamics (e.g., Erceg and Levin (2013))
      - Alternative views of wage and price dynamics (e.g., Kiley (2013))
      - Frameworks that incorporate financial intermediation (e.g., Guerrieri, Iacoviello, and Minetti (2012), Kiley and Sim (2011))

# Macroeconomic Models and Forecasting

- “Models” are a key input to forecasting
  - DSGE models have recently played a larger role in forecasting at the Fed
    - Such models forecast about as well as leading competitors (Edge, Kiley, and Laforde (2008))
    - Nonetheless, these models do not forecast very well (Edge and Gurkaynak (2010))
    - By using a large number of models/approaches/judgment, Fed staff forecasts are able to improve upon any one approach and provide valuable policy guidance (Romer and Romer (2008))
  - DSGE models are also very useful in other respects
    - What are the key shocks hitting the economy, and hence how should policy respond?
    - How large is the gap in resource utilization? (Edge, Kiley, and Laforde (2008), Kiley (forthcoming))

# “Slack” from a DSGE model (Kiley, forthcoming)

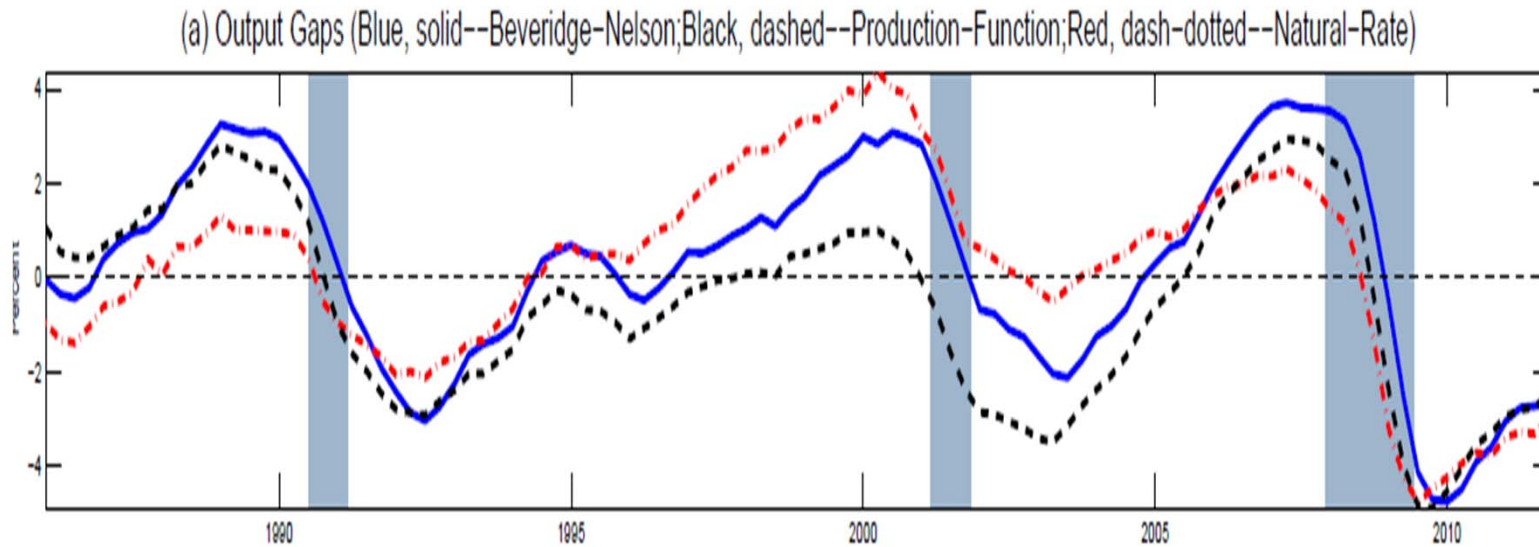


Table 7: Correlation of Gaps with Unemployment Rate

Gap measure	Levels	Changes
Beveridge-Nelson	-0.83	-0.82
Natural rate	-0.97	-0.86
CBO	-0.93	-0.62
FRB/US	-0.93	-0.60

# Incorporating Financial Frictions into Macroeconomic Models

- Fluctuations in financial frictions play a key role in how policy models are used
  - In EDO, exogenous fluctuations in a risk premium account for the lion's share of macroeconomic fluctuations; In SIGMA, key risks from international conditions often are modeled as exogenous fluctuations in a risk premium
  - Emphasis on exogenous movements in risk premiums reflects both the simplicity of the models and the fact that amplification of other shocks through fluctuations in risk premiums is often moderate (or less) in such models (e.g., Boivin, Kiley, and Mishkin (2011))
- Key Question – How to move beyond exogenous shocks to risk premiums
- A model of intermediaries in the presence of financial frictions (Kiley and Sim (2011))
  - **Intermediaries are essential**
  - **Debt financing is cheap** (liquidity services, tax preference)
  - Internal funds cheaper than external funds (e.g., **costly to issue equity**)
  - **Maturity mismatch** – timing of returns creates funding risk
  - Implications: **Capital policy** central to intermediary behavior and real effects of shocks

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