



Liberty Street Economics

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Appendix to “The FRBNY DSGE Model Forecast—November 2016”

DSGE Model Q & A

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1. What is the FRBNY DSGE model?

The FRBNY DSGE model is a medium-scale structural model of the macroeconomy employed as a tool to inform economic forecasting and monetary policy. Dynamic stochastic general equilibrium models work by attributing observed economic behavior to a number of unobserved underlying shocks. [This Federal Reserve Bank of New York staff report](#) and [this *American Economic Journal* article](#) describe a variant of the model used here. For the code used to estimate this model, see the FRBNY-DSGE [GitHub repository](#).

2. What is the model’s purpose?

This model has many applications for policymakers. First, it can produce forecasts of important macroeconomic variables such as output and inflation. Second, the model’s microfoundations provide a framework for understanding economic conditions. In particular, the model allows us to explain the source of economic fluctuations (shocks) and the key causal relationships between different components of the economy. The model’s shocks are in turn used to infer unobserved variables, such as the natural rate of interest and the output gap. Third, it allows researchers to analyze economic outcomes under different scenarios or in the face of alternative policies.

3. Which data are used to estimate this model?

The current version of the model is estimated using data on gross domestic product (GDP), gross domestic income (GDI), real personal consumption expenditures (PCE), real investment, real wages, hours worked, inflation (as measured by the PCE and GDP deflators), the federal funds rate (FFR), the ten-year nominal Treasury bond yield, ten-year survey-based inflation expectations, the Baa/ten-year Treasury bond yield spread, and total factor productivity. These data are quarterly and span the period from 1960 to the latest quarter of data available. We also use market expectations of the future FFR to capture forward guidance. The forecasts further incorporate the average of daily realizations for the current quarter of the FFR, the ten-year Treasury yield, and the spread between them.

4. What is the output gap?

The output gap is the difference between actual output and potential output. Potential output is defined as the level that output would assume in a world where labor and capital are fully utilized, that is, where there are no nominal rigidities or markup shocks. The latter shocks represent exogenous fluctuations in price and wage inflation arising from various sources, such as variations in the degree of market power or in the price of commodities. A positive (negative) output gap indicates that output is above (below) its potential.

5. What is the natural rate of interest?

The natural rate of interest is a concept analogous to potential output: it represents the rate of interest that would prevail in the economy absent nominal rigidities and markup shocks. Comparing the natural rate to the actual interest rate provides a more accurate assessment of the stance of monetary policy than what could be inferred by the interest rate level alone. A May 2015 [Liberty Street Economics blog post](#) further discusses the importance of the natural rate in the context of the FRBNY DSGE model.