Monetary Policy and the Taylor Rule

Economics 301: Money and Banking

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1.1 Goals

Goals and Learning Outcomes

- Goals:
  - Understand how the Fed makes interest rate decisions under the dual mandate.
  - Describe the conduct of monetary policy with an interest rate rule.
- Learning Outcomes:
  - LO7: Identify and analyze macroeconomic problems using graphical and computational models and prescribe appropriate monetary policy solutions.

2 Taylor Rule

2.1 Targets

First Target: Inflation

- Assume there is an explicit or implicit target for the rate of inflation.
  - Example: Bank of England has an explicit target inflation rate of 2%.
  - The Fed does not have an explicit target, it is viewed that its likely target is 2%.
- Suppose inflation is currently above 2%.
  - Suggest a monetary policy to steer the economy to this target. Describe and illustrate the impact on real GDP and price level.
- Suppose inflation is currently below 2%.
  - Suggest a monetary policy to steer the economy to this target. Describe and illustrate the impact on real GDP and price level.

Second target: Level of Macroeconomic Activity

- The second target may include any of the following:
  - Level of Real GDP relative to Potential Real GDP.
  - Growth rate of real GDP.
  - Unemployment rate.
- Suppose real GDP is below potential GDP.
  - Suggest a monetary policy to steer the economy to this target. Describe and illustrate the impact on real GDP and price level.
- Suppose unemployment is below its "natural rate" level.
  - Suggest a monetary policy to steer the economy to this target. Describe and illustrate the impact on real GDP and price level.

2.2 Taylor (1993) Rule

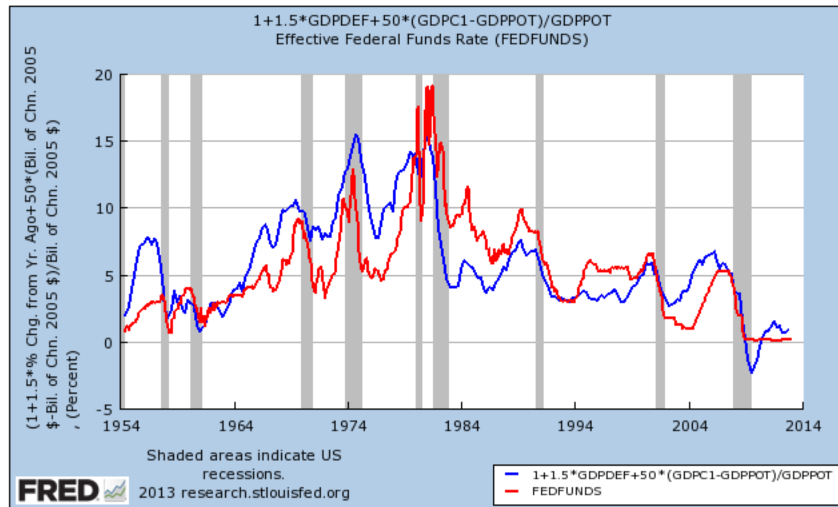
Taylor Rule

- The **Taylor rule** is an equation for the federal funds rate that reasonably approximates theory and practice of monetary policy behavior.
- Taylor (1993) suggested the equation is,

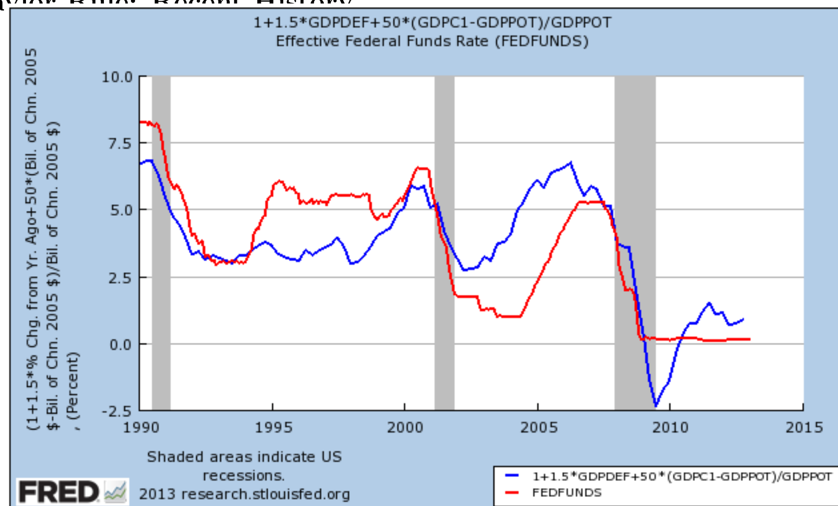
$$r_t = 1 + 1.5\pi_{t-1} + 0.5\left(\frac{GDP_{t-1} - GDP^*_{t-1}}{GDP^*_{t-1}}\right)$$

  - Subscript t denotes time: t denotes the quarter/month of interest, $t-1$ denotes the previous month.
  - r_t is the federal funds rate.
  - π_t is the rate of inflation.
  - GDP_t is real GDP.
  - GDP^*_t is potential GDP.

Taylor Rule History



Taylor Rule: Recent History



2.3 Mankiw's Taylor Rule

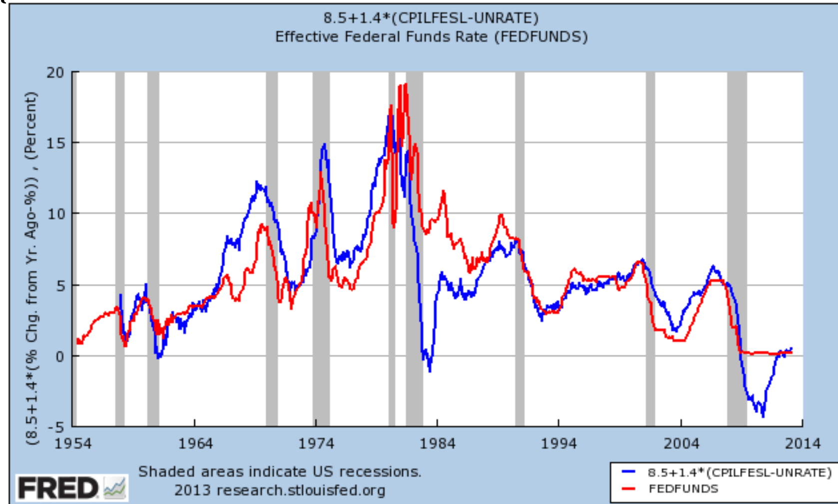
Mankiw's Taylor Rule

- Gregory Mankiw suggested that the Fed has been following this monetary policy rule:

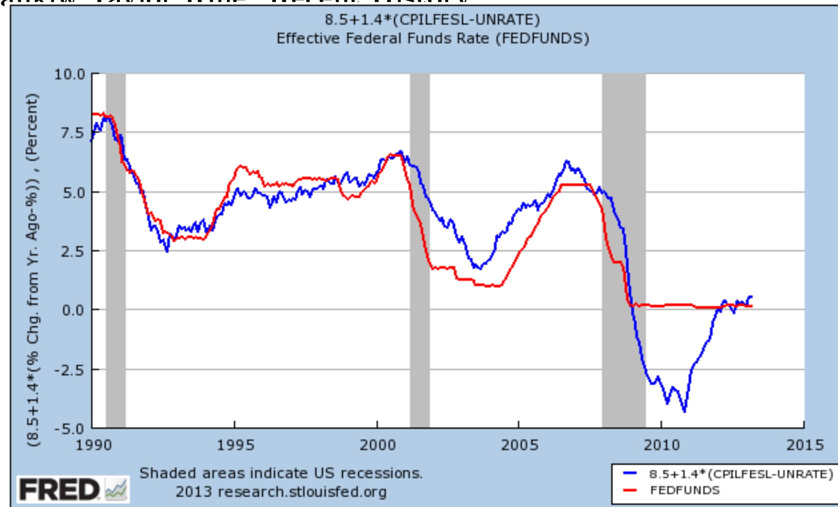
$$r_t = 8.5 + 1.4(\pi^c_{t-1} + u_{t-1})$$

  - r_t is the federal funds rate.
  - π^c_t is the *core* rate of inflation.
  - u_t is the unemployment rate.

Mankiw's Taylor Rule History



Mankiw Taylor Rule: Recent History



2.4 Empirical Monetary Policy Rules

Empirical Monetary Policy Rules

- Similar equations have been estimated on the data:

$$r_t = \alpha_0 + \alpha_r r_{t-1} + \alpha_\pi \pi_{t-1} + \alpha_u u_{t-1} + \epsilon_t$$

- Notice, $0 < \alpha_r < 1$ implies the federal funds rate takes time to adjust.

3 Inflation Rates Information

3.1 Problems with the CPI

Problems With Consumer Price Index

- Substitution bias: CPI uses a constant basket of goods, consumers substitute away from higher priced goods.
- New goods bias: new goods with better technology, higher capabilities, are compared to older, "similar" goods.
- Quality bias: improvements in quality that lead to higher prices may be measured as higher prices.
- Outlet bias: in the face of rising prices, people may spend more effort trying to find low prices.
- The CPI overstates inflation by about 1.1%.

3.2 Problems with the GDP Deflator

Problem with the GDP Deflator

- Good = Not subject to above biases.
- Comes out quarterly by Bureau of Economic Analysis.
- Monetary policy would be hindered by a significant "recognition lag."

3.3 Problems with Food and Energy Prices

Core Inflation

- Core CPI: CPI will all items except food and energy.
- Why not include food and energy?
  - No change in money supply can change *relative prices* of food and energy.
  - Food and energy prices are very volatile. Recent movements in prices are not indicative of trends.
  - Recent trends of other goods besides food and energy are actually better predictors of future movements in prices of food and energy.

4 Implications for Fiscal Policy

4.1 Counteracting Monetary Policy

Implications for Fiscal Policy

Suppose the economy is in recession, and the government engages in fiscal stimulus.

- Examples: Government cuts taxes, and/or increase government spending, and/or increase transfers
- To the extent is is successful, what will be the impact on the federal funds rate?
- What is the impact of the monetary policy response on the stimulus efforts of the fiscal authority?

4.2 Fiscal Policy in a Liquidity Trap

Liquidity Trap

- **Liquidity trap:** expansionary monetary policy fails to lower interest rates.
- **Zero-lower bound:** Interest rates are so low, that monetary expansion cannot lower interest rates.
- Stronger case for fiscal stimulus:
  - Monetary stimulus is exhausted.
  - With interest rates remaining at zero, monetary policy won't counteract fiscal stimulus effectiveness.

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Reading

- Taylor Rule:
  - Taylor, John, (1993), "Discretionary versus policy rules in practice," *Carnegie Rochester Conference Series on Public Policy*, 39: 195-214.
  - Mankiw, Gregory (2002), "U.S. Monetary Policy During the 1990s," In *American Economic Policy in the 1990s*, MIT Press.
- Defending core inflation:
  - Dolmas, James (2011), "Inflation Measurement Gives Us Food for Thought," *Economic Letter*, 6(4): 1-4.