

# Monetary Policy and the Taylor Rule

Economics 301: Money and Banking

# Goals and Learning Outcomes

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  - 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.

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## First Target: Inflation

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- 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%.
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## Second target: Level of Macroeconomic Activity

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- 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.
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# Taylor Rule

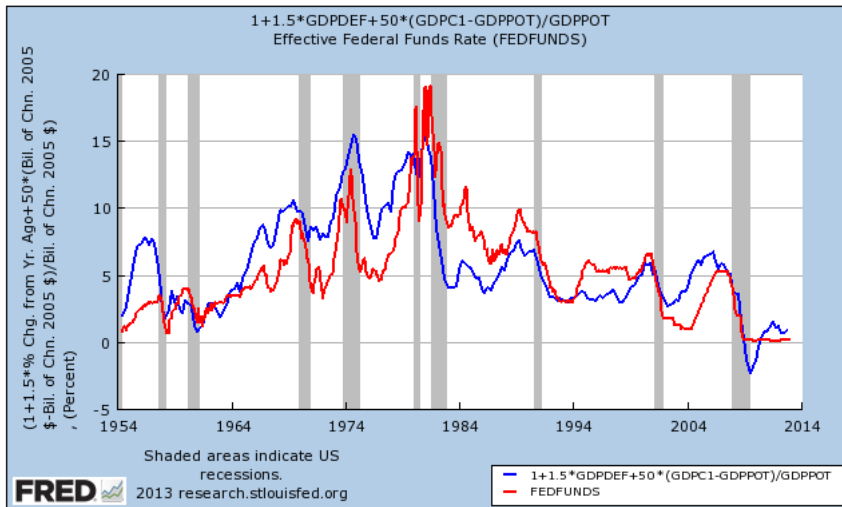
- The **Taylor rule** is an equation for the federal funds rate that reasonably approximates theory and practice of monetary policy behavior.
- Taylor (1993) suggested the equation is,

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

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

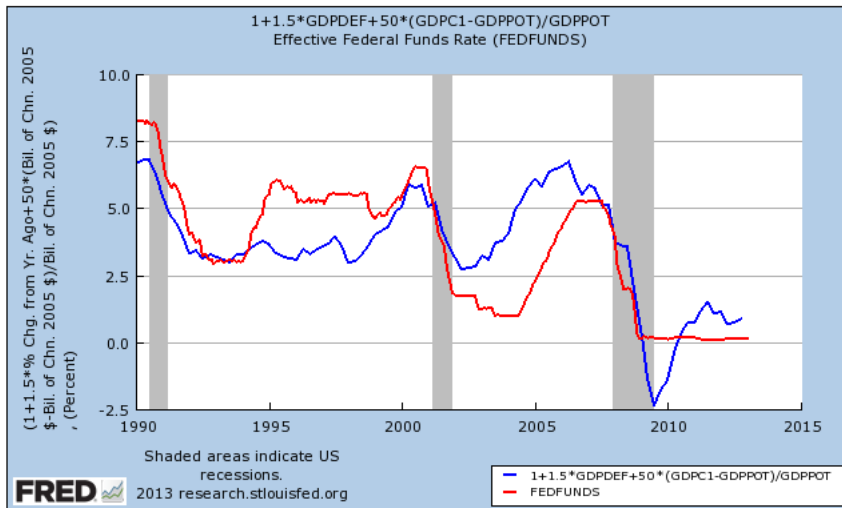
# Taylor Rule History

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# Taylor Rule: Recent History

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# Mankiw's Taylor Rule

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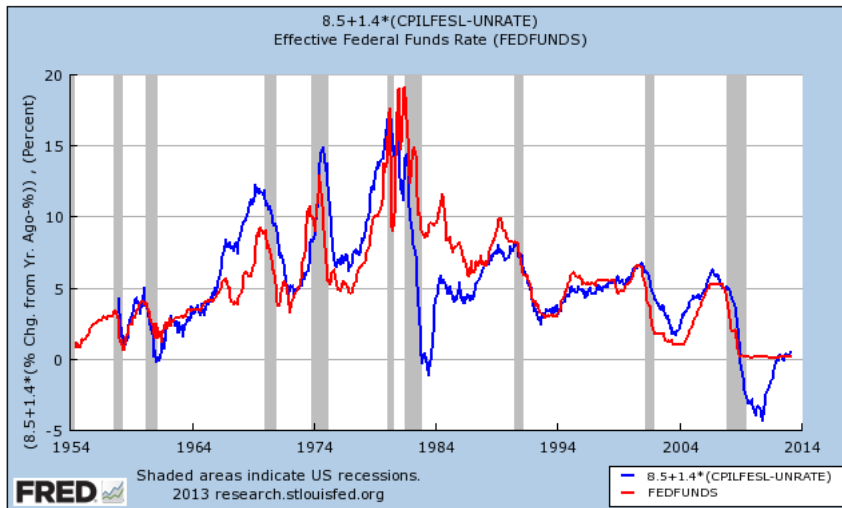
- Gregory Mankiw suggested that the Fed has been following this monetary policy rule:

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

- $r_t$  is the federal funds rate.
- $\pi_t^c$  is the *core* rate of inflation.
- $u_t$  is the unemployment rate.

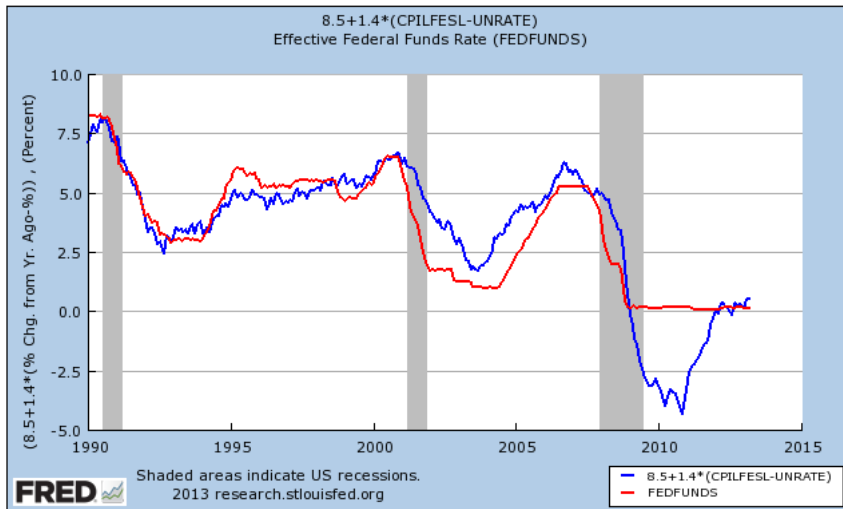
# Mankiw's Taylor Rule History

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# Mankiw Taylor Rule: Recent History

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# Empirical Monetary Policy Rules

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- 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.



## Problems With Consumer Price Index

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- 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%.

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## Problem with the GDP Deflator

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

## Core Inflation

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- 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.

## Implications for Fiscal Policy

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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 it 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?



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# Liquidity Trap

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- **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 counter-act fiscal stimulus effectiveness.

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- 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.