

Variants of the Taylor rule

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Abstract

Balanced-approach, inertial, forward-looking and first-difference rules, and the five rules the Fed publishes twice a year.

The original rule from The Taylor rule is one point in a family. Every variant changes one of three things: how strongly the rate reacts to the gap, whether the rate adjusts gradually, and whether the inputs are current, expected or lagged values. Knowing the family matters because the prescriptions can differ by several percentage points at the same moment.

Stronger response to the gap: the “balanced approach”

Taylor himself examined a version with a coefficient of 1.0 instead of 0.5 on the output gap (Taylor, 1999):

$$i_t = r^* + \pi_t + 0.5 (\pi_t - \pi^*) + 1.0 x_t. \quad (1)$$

In Federal Reserve publications this is the **balanced-approach rule**. It prescribes lower rates in recessions and higher rates in booms than the 1993 rule, and it was the version most often cited by FOMC members after 2010, when the output gap was large and negative.

Gradual adjustment: inertial rules

Estimated rules almost always find that the rate moves slowly toward the prescription:

$$i_t = \rho i_{t-1} + (1 - \rho) [r^* + \pi_t + \phi_\pi (\pi_t - \pi^*) + \phi_x x_t], \quad 0 < \rho < 1. \quad (2)$$

Values of ρ around 0.7 to 0.9 per quarter are typical in estimates (Clarida et al., 2000). Two explanations compete. One is pure smoothing: central banks dislike reversals and move in small steps. The other is that with forward-looking agents a *promise* of persistence is powerful, because long rates respond to the expected path of short rates; Woodford shows that inertia can be part of an optimal rule for exactly that reason (Woodford, 2003).

Forward-looking rules

Clarida, Galí and Gertler replaced current inflation with the expected inflation rate k periods ahead (Clarida et al., 2000):

$$i_t^* = r^* + \pi^* + \phi_\pi (\mathbb{E}_t \pi_{t+k} - \pi^*) + \phi_x \mathbb{E}_t x_{t+q}. \quad (3)$$

The appeal is that policy works with a lag, so reacting to forecasts is more sensible than reacting to the past. The cost is that forecasts are not observable, which makes such rules harder to verify from outside. Inflation-forecast targeting, the framework several central banks describe themselves as using, is the limit case: the instrument is set so that the forecast hits the target at the policy horizon (Svensson, 1997).

First-difference rules

A first-difference rule reacts with the *change* in the rate rather than its level:

$$i_t = i_{t-1} + 0.5 (\pi_t - \pi^*) + 0.5 (x_t - x_{t-4}). \quad (4)$$

Its virtue is that it needs neither r^* nor the *level* of the output gap, the two quantities that The natural rate of interest and Real-time data and the Taylor rule show to be the least reliable inputs. Orphanides argued for rules of this kind on exactly those grounds (Orphanides, 2003). The price is that the rule can drift: nothing anchors the level of the rate except the history of past changes.

The Fed’s published set

Since 2017 the Federal Reserve’s semi-annual *Monetary Policy Report* has carried a section on policy rules that reports the prescriptions of a fixed set of rules alongside the actual funds rate (Board of Governors of the Federal Reserve System, 2024). The set is:

Rule	What distinguishes it
Taylor (1993) rule	Coefficients 0.5 and 0.5, the rule of the previous lesson
Balanced-approach rule	Coefficient 1.0 on the gap, (1)
Balanced-approach (shortfalls) rule	Reacts to the gap only when it is negative, in line with the 2020 strategy statement’s focus on employment <i>shortfalls</i> (Federal Open Market Committee, 2020)
Adjusted Taylor (1993) rule	Makes up for the period when the lower bound kept rates above the rule’s prescription
First-difference rule	(4), no r^* or gap level needed

The report is explicit that the FOMC does not follow any of them, and that they disagree with each other by percentage points at turning points. That disagreement is the honest summary of this lesson: the *form* of the rule is a choice with consequences, not a technical detail.

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