The Taylor Rule: A benchmark for monetary policy?

The Taylor rule is a simple equation, that is intended to describe the interest rate decisions of Central Banks.

r = p + 0.5y + 0.5(p – 2) + 2

(the “Taylor rule”)

Where:

r = the federal funds rate

p = the rate of inflation

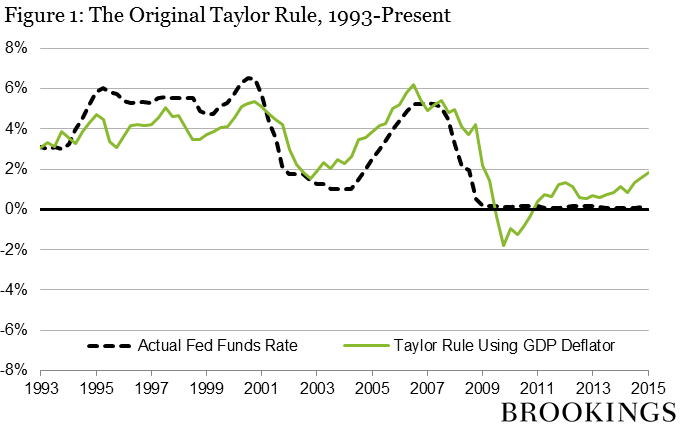
y = the percent deviation of real GDP from a target, as potential output of the economy. With that assumption, the variable *y* in the Taylor rule can be interpreted as the excess of actual GDP over potential output, also known as the output gap.

## TAYLOR’S CRITIQUE OF FED POLICY

Originally, in his 1993 article, John Taylor pointed out that a simple mechanical rule could not take into account the many factors that policymakers must consider in practice, in many ways, policymakers took sensible decisions all the time. As an economist researcher, we often referred to various policy rules, including variants of the Taylor rule. However, it seems obvious that such rules could not incorporate all the relevant considerations for making policy in a complex dynamic economy.

* First, we could argue that lower interest rates than prescribed by the Taylor rule during 2003-2005, and that its deviations were a major source of the housing bubble and other financial excesses.
* Second, from Figure X, Central Bank’s monetary policy since the financial crisis has not been sufficiently rule-like, and that policy has been too easy. Following the Taylor rule, Central Banks would have ended its policy of near-zero interest rates several years ago.

To construct Figure 1, we followed Taylor’s original paper, considering CPI and not other measures as the GDP deflator. To measure the output gap, for the period through 2009, we used estimates prepared by Central Bank’s meetings. Importantly, for all figures in this post, I used only data that were known to policymakers at the time they made their decisions. Because initial data are often substantially revised, using real-time data is essential for evaluating policy choices.

[[](https://www.brookings.edu/wp-content/uploads/2015/04/Taylor_fig1_new.png)](https://www.brookings.edu/wp-content/uploads/2015/04/Taylor_fig1_new.png)

As for the period since the financial crisis, the Taylor rule suggests that the “right” funds rate was quite negative, at least until very recently. If the Taylor rule predicts a sharply negative funds rate, which of course is not feasible, then it seems sensible for Central Banks to keep the funds rate close to zero (about as low as it can go) while looking for other tools (like purchases of securities) to achieve further monetary ease. The Taylor rule provides no guidance about what to do when the predicted rate is negative, as has been the case for almost the entire period since the crisis.

Also, it is important to point out that the growth recovery has been disappointing. The financial crisis of 2007-2009 was the worst at least since the Depression, and it left deep scars on economies. The recovery faced other headwinds, such as tight fiscal policy from 2010 on and the resurgence of financial problems in Europe. Compared to other industrial countries, the US has enjoyed a relatively strong recovery from the Great Recession. (ADD FIGURE)

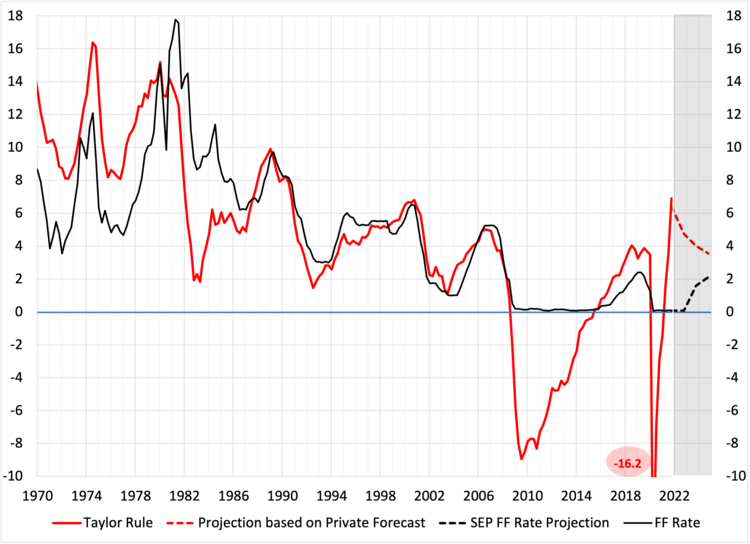
In our view, underestimating both the risks that inflation will remain high and the costs of Central Banks losing credibility. It is not sufficient to point to low bond yields as evidence that inflation expectations are under control. As [Sargent and Silber](https://www.wsj.com/articles/the-market-is-too-serene-about-inflation-interest-rate-paul-volcker-fomc-federal-reserve-price-stability-11641933266) argue, the bond market was an unreliable indicator during the Volcker disinflation of the early 1980s and it may be lagging again.

The continued mix of expansionary fiscal and monetary policies in 2021 (long after the recovery had gained momentum), combined with high prices, provides strong evidence of a shift in the inflation regime. Moreover, for some economies high inflation readings are influencing price- and wage-setting on a scale that we have not witnessed in decades.

Of course, inflation is notoriously difficult to forecast. However, forecast accuracy should encourage greater reliance by policymakers on trend measures of inflation. Put differently, any claim that a positive inflation surprise is transitory embeds the belief that inflation will recede on its own. In recent experience, trend inflation initially rose in April 2021. By June, nearly all measures of core inflation exceeded the Fed’s stated longer-term goal.

Putting this all together, Central Banks needs a plan to raise rates quickly and substantially. By how much? To get a sense of the magnitudes, we compute a simple Taylor rule and display the results in the next chart. Starting with the history, we show the actual federal funds rate target in black and the Taylor rule rate in solid red. The two follow each other relatively closely from the mid-1980s through 2007. Importantly, however, during periods when the policy rate falls persistently short of the Taylor rule rate, as in the 1970s, inflation tends to rise.

Federal Funds Rate, Taylor Rule rate, and projected rule rates, quarterly, 1970-2024



Turning to the more recent period, we see that by the end of 2021, with ex-food and energy PCE inflation running about 4½ percent, the Taylor rule implied a policy rate of nearly 7 percent. Even if core inflation comes down by a percentage point during 2022—that is, by more than the recent trimmed mean PCE inflation rate implies—the projected Taylor rule rate will remain above 5 percent. While it is not obvious from the chart, for Central Banks to ensure inflation returns to its target of 2%, policymakers likely will need to bring the short-term real interest rate into significantly positive territory.

Inflation rose very quickly, so it may still be possible to bring it down sharply without a recession. The more decisively policymakers act, the lower the long-run costs are likely to be. Indeed, we are skeptical of arguments that an aggressive monetary policy tightening would be particularly damaging over time to those with lower incomes. Rather, the experience of recent decades is that job and wage gains for those with low incomes are most closely associated with long, relatively steady expansions. Failure to restore price stability in a timely way would almost surely render this expansion disturbingly short compared to recent norms.

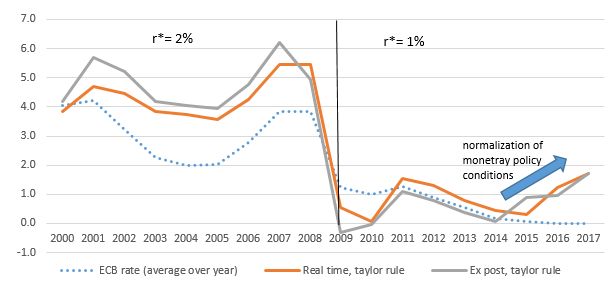
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With these assumptions, we find that for the ECB the Taylor rule would have prescribed a higher interest rate prior to the crisis and thereafter a much faster and deeper decline (see Figure 2). According to the Taylor rule, based on *ex post* data, 2015 would have been the point in time when the ECB should have started to raise the interest rate. In reality, this is when the ECB did the opposite by loosening further monetary conditions through its massive bond purchase program.

For 2016, both *ex ante* and real-time data would have called for an increase of its interest rate. Using the output gap and the GDP deflator as provided by the European Commission forecasts for 2017, the rule’s predicted policy rate points to a further increase led by another narrowing of the output gap and a rise in the deflator.

*Figure 2. The Taylor rule for the eurozone*



The time has come to prepare for an exit from unconventional policies that are no longer needed, given the absence of any signs of deflation.