Enhancing Resilience with Monetary Policy Rules

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The Fed's next policy strategy review should aim to discipline discretion, help the FOMC be more systematic. This can be achieved by using simple policy rules to explain policy and by providing to the public pertinent information in real time. Since notable deviations of policy from simple rules with desirable robustness characteristics would warrant explanation, public disclosure of deviations would constrain discretion. Study of two simple rules that have been presented in the Fed's Bluebook/Tealbook starting in 2004, but not disclosed to the public in real time, illustrates how this approach would have helped the Fed during the recovery from the pandemic.

I. Introduction

Since its founding in 1913, the Federal Reserve has been adapting its policy strategy from time to time. In recent years, the Fed has been more open about this process. The ability to critically evaluate past performance, learn from mistakes, and espouse new knowledge is the hallmark of a good institution. Though the Fed's adaptation of its policy strategy has not been uniformly positive, Federal Reserve policy has improved over the past few decades with the adoption of some features of the Inflation Targeting approach.

Yet, Fed policy continues to be hampered by episodes characterized by excessive use of discretion that is inconsistent with systematic policy. The post-pandemic inflation episode provides a recent example of the consequences. The resilience of the Fed's monetary policy strategy would be enhanced by constraining discretion.

The Fed's next policy strategy review should aim to discipline discretion, help the FOMC be more systematic. This can be achieved by using simple policy rules to explain policy and by providing to the public pertinent information in real time.[1] Rules that have been part of the FOMC briefing materials but not disclosed to the public in real time can serve this purpose.

Simple rules can serve as a cross-check of the Fed's discretionary policy, as has been advocated by numerous observers over the years, including former and current Fed officials. Since notable persistent deviations of policy from simple rules would warrant explanation, public disclosure would discipline discretion. Two simple rules that have been presented in the Fed's Bluebook/Tealbook starting in 2004 provide an illustration of how this approach would have helped the Fed during the recovery from the pandemic.

II. The post-pandemic policy error

Following the successful disinflation of the 1980s and 1990s, under Chairs Volcker and Greenspan the Fed generally succeeded in fulfilling its mandate better than in the past. From the 1980s, and until the pandemic, inflation, and inflation expectations have been better behaved (Figure 1). The adoption of a 2 percent goal as a numerical definition of price stability in 2012 was a major positive step for the Fed. However, the post-pandemic inflation raised questions about the resilience of the Fed's policy strategy. While the Fed eased policy forcefully in 2020, as was appropriate, it was far too late in normalizing policy during the recovery. What went wrong has been discussed extensively, including in previous editions of this conference.[2] Yes, some of the inflation was unavoidable, and could be attributed to adverse shocks. But monetary

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[1] See Fischer (1990) and Taylor and Williams (2011) for reviews of this literature.
[2] Bordo et al, (2023, 2024), Eggertsson and Kohn (2023), Orphanides (2023).

policy was part of the problem. The Fed got trapped in the forward guidance it provided about future policy, deviated from what would be expected if policy had been systematic.

After the pandemic, the Fed used its discretion to peg the federal funds rate at zero for too long, even as inflation and inflation expectations were rising (Figure 2). With the Fed keeping nominal interest rates inappropriately low, *real* interest rates kept falling to more and more negative levels while the economy was growing rapidly, fueling inflation. It is hard to square the Fed's policy during 2021 with a systematic policy approach. During the post-pandemic recovery, policy not only violated the Taylor principle, as is evident in the figure; It also failed to respect the first of the two limitations on monetary policy that Milton Friedman had highlighted in his 1967 AEA Presidential address. Monetary policy, Friedman wrote: "cannot peg interest rates for more than very limited periods" (Friedman, 1968, p. 5).

During the course of 2021, real interest rates at short- and intermediate maturities were driven to extreme lows. The one-year real rate implied by OIS and inflation swap rates fell to below minus 4%, and stayed improperly low until after the Fed started adjusting rates in March 2022.

The recent experience illustrates that implementing policy with nominal interest rates, can be challenging.[3] Of course, systematic monetary policy can be implemented and communicated with a nominal interest rate, but this requires adjustment in a systematic fashion to account for the evolution of the economy, especially inflation: Policy must be informed by a well-specified policy reaction function (McCallum, 1981, 1986).

One lesson from the post pandemic policy error is that Fed policy has not been sufficiently systematic. The post-pandemic experience is an illustration of an underlying challenge that has hampered monetary policy over time: policymaker proclivity towards excessive discretion.

III. The challenge of constraining unhelpful discretion

Insufficient guidance from policy rules and excessive reliance on discretion is not a new challenge. This is a well-known problem for monetary policy design. The central bank may have the mandate to deliver price stability over time, but policymakers are human. At times, politics can get in the way, behavioral biases can have an undue influence on policy decisions. The risk of inappropriate use of discretion is one of the reasons why in 1962 Milton Friedman had argued against central bank independence.[4]

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[3] With a monetary aggregate instrument, a robust rule can this can be simpler, for example the k-percent money growth rule advocated by Milton Friedman. However, the financial innovation of recent decades has led to a deterioration of the effectiveness and robustness characteristics of such rules.

[4] Friedman considered this to be a problem especially "in times of uncertainty and difficulty" (Friedman, 1962/1968, pp. 188). Orphanides (2015) discusses the consequences of behavioral biases.

A successful monetary policy framework requires a mechanism for *constraining* discretion. In the 1990s, informed by the early experience with Inflation Targeting around the world, Ben Bernanke and Rick Mishkin advocated that the Fed should adopt this framework. They suggested that constraining discretion was one of the major advantages of the approach:

> [S]ome useful policy strategies are "rule-like," in that by their forward-looking nature they constrain central banks from systematically engaging in policies with undesirable long-run consequences; but which also allow some discretion for dealing with unforeseen or unusual circumstances. These hybrid or intermediate approaches may be said to subject the central bank to "constrained discretion." (Bernanke and Mishkin, 1997, p. 104.)

Indeed, the Inflation Targeting framework has been an innovation that has had some success in this regard. Some of the steps adopted by the Fed over the past few decades have moved the Fed's policy strategy in that direction. However, success in practice is determined by institutional factors and what may appear to be implementation details that sometimes are not details at all.

One factor that hinders success for the Fed, compared to many other central banks, is the formulation of its mandate. A literal interpretation of the Fed's statutory mandate, to simultaneously deliver maximum employment and price stability, is simply infeasible. In contrast, legislation of most inflation targeting central banks identifies price stability as the primary mandate of the central bank, which is, after all, the best way to support sustainable growth and employment over time.

Interestingly, before Inflation Targeting was adopted around the world, under Chairs Volcker and Greenspan, the Fed interpreted its mandate in this manner. I recall that when I joined the Federal Reserve as an economist, it was considered unhelpful to discuss in public the maximum employment side of the Fed's mandate.

Monetary policy in the Volcker-Greenspan era was fairly systematic and more successful than in earlier years, because it focused, as Chair Greenspan summarized in 2004, on "maximizing the probabilities of achieving our goals of price stability and the maximum sustainable economic growth that we associate with it" (Greenspan, 2004, p. 37).

Since 2012, the Fed has been far more explicit about the maximum employment part of its mandate. However, the tension of simultaneously delivering maximum employment and price stability makes systematic policy harder. Constraining discretion successfully is more important for the Fed than for inflation targeting central banks with a mandate that recognizes the primacy of price stability.

IV. Simple rules as a cross-check

One way to constrain discretion is by using simple policy rules as guidelines, acknowledging the limitations of simply following a specific mechanical formula at all times (Taylor, 1993).

Viewed in this manner, simple rules can supplement other analytical tools associated with the Inflation Targeting approach. Simple rules can serve as a cross-check, as proposed and implemented by Jan Qvigstad at the Norges Bank (Qvigstad, 2005). The Norges Bank published a list of criteria for setting the interest rate with Criterion 6 describing the role of simple rules:

> "It may also be useful to cross-check by assessing interest rate setting in the light of some simple monetary policy rules. If the interest rate deviates systematically and substantially from simple rules, it should be possible to explain the reasons for this." (Norges Bank, 2005, p. 28)

With this approach, while policy retains some discretion, decisions are informed by simple rules. The central bank is expected to provide information to the public that can be used to monitor deviations and explain the reasons for substantial deviations. The public disclosure and commitment to explain deviations constrains discretion, facilitating more systematic policy.

Simple rules that are well-suited to serve this purpose are rules with desirable robustness characteristics, informed by policy research. The rules employed as a cross-check should be subject to periodic reviews and adaptation. Since no single simple rule can be robust against all possible sources of error in policy analysis, focusing on a couple alternatives that are robust across different dimensions can prove incredibly useful in practice.

Desirable characteristics of robust interest rate policy rules have been studied extensively in recent decades and are well understood. Good rules must preserve price stability over time, and maintain inflation expectations well-anchored, in line with the central bank's goal; they must be forward-looking, embracing the informational benefits of current analysis, now-casting, and short-term projections; they must be somewhat countercyclical, tempering business cycle booms and busts; and they must be robust to imperfect knowledge.

V. Two simple rules from the Fed's Bluebook/Tealbook

How could the Fed adapt its current strategy in this direction? Fed staff has been at the forefront of policy research and analysis with simple rules and has been tracking prescriptions from simple interest rate rules since the 1990s. Starting with the January 2004 FOMC meeting, real-time prescriptions from simple rules have been presented to the FOMC in the Bluebook/Tealbook that is prepared for each regularly scheduled FOMC meeting. However, the Fed has not been disclosing this analysis to the public in real time. At present, prescriptions from simple rules monitored by staff and presented to the FOMC in real time are available until 2018.

The Fed's next policy strategy review could adopt the incremental step of providing simple rules analysis to the public in real time. The Fed could explain the systematic nature of policy with simple rules and, importantly, explain deviations of its policy decisions from simple rules, when notable deviations are evident. Such analysis could be provided on a quarterly basis, with the presentation of the FOMC's Summary of Economic Projections (SEP). Public disclosure would discipline discretion and improve policy. Since notable deviations would warrant explanation, the Fed would be less prone to ignore deviations from systematic policy with no good reason.

The usefulness of this approach can be illustrated by considering two simple rules that have been part of the Bluebook/Tealbook prepared for all FOMC meeting for which the information is currently available to the public, starting in January 2004. The first rule is a variant of the original Taylor rule: It provides a prescription for the level of the policy rate, using the sum of the inflation gap and the output gap as the main input. The second is a variant that provides a prescription for the quarterly change of the policy rate, using the projected deviation of nominal GDP growth from the natural growth rate as the input:[5]

> Classic Taylor rule: $i = r^* + \pi + \theta(\pi - \pi^*) + \theta y$

> Natural Growth Targeting rule: $\Delta i = \theta(n - n^*)$

Both are one-parameter rules, with their responsiveness to perceived deviations from the normal state of the economy governed by the parameter θ. Following the original formulation in Taylor (1993), both rules have been tracked with $\theta = 0.5$.[6]

The Tealbook variant of the Taylor rule has been implemented using current-quarter projections of inflation and the output gap as inputs, in line with Taylor's original timing convention. The use of projections is necessary to make the rule operational because of the lags associated with data releases. Unlike the original formulation, however, the core PCE concept of inflation has been employed, instead of GDP deflator inflation. In addition, the equilibrium real interest rate employed has varied over time, reflecting perceived variation in the concept by Fed staff and FOMC participants.

The natural growth targeting rule was originally formulated to respond to the deviations of projected nominal GDP growth, n, from the natural growth rate of nominal GDP, n^*, approximated as the inflation goal plus the growth rate of real potential GDP, $n^* \approx (\pi^* + g^*)$. It responds to the projected growth gap over four quarters, ending three-quarters ahead. Instead

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[5] Here, i denotes the policy rate, r^* the natural/equilibrium real interest rate, π the inflation rate, y the output gap and n nominal income growth. π^* and n^* are the inflation goal and natural growth of nominal GDP that is consistent with the inflation goal.

[6] The natural growth targeting rule was developed at the Fed as a variation of the original Taylor rule that could emulate Friedman's k-percent rule for money growth, and McCallum's rule for the monetary base with an interest rate instrument instead of a monetary aggregate. Alternatively, it may be viewed as a price-level targeting variant of the Taylor rule, in first-difference form. See Nelson (2020), Orphanides and Williams (2002), Orphanides (2003, 2024) and Williams (2017) for related discussion.

of responding to the nominal GDP growth gap, this rule can be rewritten as responding to the sum of the inflation gap and the real growth gap. In turn, the real growth gap (over four quarters) can be approximated with the four-quarter difference in the output gap: $(n - n^*) \approx (\pi - \pi^*) + (g - g^*) \approx (\pi - \pi^*) + \Delta^4 y$. The Tealbook variant of the natural growth targeting rule has been implemented with the core PCE concept of inflation, and the four-quarter difference in the output gap. The Tealbook refers to this variant as the "first-difference" rule.

Figure 3 compares the end-quarter federal funds target rate (or midpoint of target range) to the prescriptions for these rules obtained from the historical Bluebooks and Tealbooks prepared for the first FOMC meeting in each quarter. To illustrate how public disclosure of these simple rules would have helped the Fed avoid the post-pandemic policy error, it would have been ideal to have the Tealbook prescriptions for 2021 and 2022. Since these are not yet available, we examine prescriptions from closely related variants that can be tracked in real time using public information. Instead of Tealbook projections, we can use projections from the quarterly Survey of Professional Forecasters (SPF), published by the Federal Reserve Bank of Philadelphia every quarter. Figure 4 superimposes the real-time prescriptions based on SPF projections to the Bluebook/Tealbook variants of the rules in Figure 3.[7] As can be seen, though not identical, the differences between the Tealbook and SPF variants over the 2004-2018 period (when both are available) are generally relatively small.

A comparison of actual policy with the Taylor rule and the natural growth rule indicates that both captured the contours of policy in the 2004-2011 period, but also that their prescriptions diverged in later years. Actual policy deviated significantly and persistently from *both* simple rules only in one year: 2021. While the two rules provided different guidance on the timing of liftoff, both rules indicated that the Fed needed to normalize policy during 2021.[8] Instead, the Fed kept increasing the policy accommodation it provided to the economy that year, both by reducing real interest rates, as shown in Figure 2, and by expanding its balance sheet with asset purchases.

Had the Fed started to provide information about the simple rules in the Tealbook to the public when it revised its policy strategy in August 2020, the inappropriate use of discretion during 2021 would have been checked.[9] The large deviations of policy from both of these simple rules would have likely first prompted an explanation and subsequently, as the deviations persisted, a reassessment of policy.

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[7] Additional detail on the SPF variant of the natural growth rule is provided in Orphanides (2024). Since the SPF does not include the output gap, the SPF variant of the Taylor rule shown in the figure employs the unemployment gap and Okun's law, $y \approx \kappa(u - u^*)$, with $\kappa = -2$. The variation in perceived natural rates is captured by using the median SEP responses of FOMC participants. See Orphanides (2019) for additional details.

[8] Other simple rules also indicated that the Fed had fallen behind the curve well before liftoff in March 2022 (Papell and Prodan-Boul, 2024; Tatar and Wieland, 2024).

[9] Related proposals had been made before 2020, including by FOMC participants, but were not adopted. For example, before the work on the 2020 strategy review started, FRB Cleveland President Loretta Mester proposed "using simple monetary policy rules as benchmarks to explain our policy decisions" (Mester, 2018, p. 11).

VI. Conclusion

The Fed's next policy strategy review should aim to discipline discretion, help the FOMC be more systematic.

Simple rules could serve as a cross-check on discretionary policy. The SEP could disclose in real time the prescriptions from benchmark policy rules that have been presented in the Bluebook/Tealbook since the January 2004 FOMC meeting. The simple rules would explain how monetary policy depends on the evolution of the economy. Since notable deviations of policy from simple rules with desirable robustness characteristics would warrant explanation, public disclosure of deviations would constrain discretion.

Providing this information would also help the public develop a better understanding of the likely future direction of policy and its systematic dependence on the evolution of the economic outlook, without explicit statements about the future policy rate. The unhelpful forward guidance provided with the dots should end.

Explaining policy with simple rules can discipline discretion and enhance the resilience of the Fed's monetary policy strategy.

References

Bernanke, Ben and Frederic Mishkin (1997). Inflation Targeting: A New Framework for Monetary Policy? Journal of Economic Perspectives. Spring 1997, p. 104. https://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.11.2.97

Bordo, Michael, John Cochrane and John Taylor (2023). How Monetary Policy Got Behind the Curve and How to Get Back. Hoover Institution. https://www.hoover.org/research/how-monetary-policy-got-behind-curve-and-how-get-back

Bordo, Michael, John Cochrane and John Taylor (2024). Getting Monetary Policy Back on Track. Hoover Institution. https://www.hoover.org/research/getting-monetary-policy-back-track

Eggertsson, Gauti and Donald Kohn. (2023). The Inflation Surge of the 2020s: The Role of Monetary Policy. Hutchins Center Working Paper No. 87, August. https://www.brookings.edu/articles/the-inflation-surge-of-the-2020s-the-role-of-monetary-policy/

Fischer, Stanley (1990). Rules versus Discretion in Monetary Policy. Chapter 21 In B. M. Friedman and F. H. Hahn (eds.) Handbook of Monetary Economics, Volume 2. Elsevier.

Friedman, Milton (1962/1968). Should There Be an Independent Monetary Authority? In Leland B. Yeager (Ed.), In Search of a Monetary Constitution, Harvard University Press, Cambridge, Massachusetts, 1962. Reprinted in Friedman, Milton, Dollars and Deficits, Prentice Hall, Englewood Cliffs, 1968.

Friedman, Milton (1968). The Role of Monetary Policy. American Economic Review, 58(1), March, pp. 1-17. https://www.aeaweb.org/aer/top20/58.1.1-17.pdf

Greenspan, Alan (2004). Risk and Uncertainty in Monetary Policy. American Economic Review, 94(2), pp. 33–40.

McCallum, Bennett (1981). Price level determinacy with an interest rate policy rule and rational expectations." Journal of Monetary Economics, 8(3), pp. 319-329.

McCallum, Bennett (1986). Some issues concerning interest rate pegging, price level determinacy, and the real bills doctrine. Journal of Monetary Economics, 17(1), pp. 135-160.

Mester, Loretta (2018). The Federal Reserve and Monetary Policy Communications. Rutgers University, January 17. https://www.clevelandfed.org/collections/speeches/2018/sp-20180117-federal-reserve-monetary-policy-communications

Nelson, Edward (2020). Milton Friedman and Economic Debate in the United States, 1932–1972. Volumes 1 and 2. University of Chicago Press.

Norges Bank (2005). Inflation Report with Monetary Policy Assessments, 1/2005. March 2005. https://www.norges-bank.no/contentassets/dcc304a32cc040cd82c011c49beebd1e/ir-2005-01-en.pdf?v=09032017122105

Orphanides, Athanasios (2003). Historical monetary policy analysis and the Taylor rule. Journal of Monetary Economics 50, p. 983–1022.

Orphanides, Athanasios (2015). Fear of Liftoff: Uncertainty, Rules, and Discretion in Monetary Policy Normalization. Federal Reserve of St Louis Review 97(3), pp. 173-96. https://research.stlouisfed.org/publications/review/2015/09/08/fear-of-liftoff-uncertainty-rules-and-discretion-in-monetary-policy-normalization/

Orphanides, Athanasios (2019). Monetary Policy Strategy and its Communication. In Challenges for Monetary Policy, Proceedings of the 2019 Jackson Hole Economic Policy Symposium, Jackson Hole, WY: August. https://www.kansascityfed.org/documents/6954/Orphanides_Jh2019.pdf

Orphanides, Athanasios (2023). The Forward Guidance Trap. IMES Working Paper No. 2023-E-6, October. https://www.imes.boj.or.jp/research/papers/english/23-E-06.pdf

Orphanides, Athanasios (2024). Enhancing Resilience with Natural Growth Targeting. IMFS Working Paper 200, February. https://www.imfs-frankfurt.de/en/research/imfs-working-papers.html

Orphanides, Athanasios, and John C. Williams (2002). Robust Monetary Policy Rules with Unknown Natural Rates. Brookings Papers on Economic Activity 2002(2), pp. 63–145. https://www.brookings.edu/bpea-articles/robustmonetary-policy-rules-with-unknown-natural-rates/

Papell, David and Ruxandra Prodan-Boul (2024). Policy Rules and Forward Guidance Following the COVID-19 Recession. Working paper, April. https://dx.doi.org/10.2139/ssrn.4083466

Tatar, Balint, and Volker Wieland (2024), Taylor Rules and the Inflation Surge: The case of the Fed. IMFS Working Paper 201, February. https://www.imfs-frankfurt.de/en/research/imfs-working-papers.html

Taylor, John (1993). Discretion versus Policy Rules in Practice. Carnegie Rochester Conference Series on Public Policy 39, no. 1, 195–214.
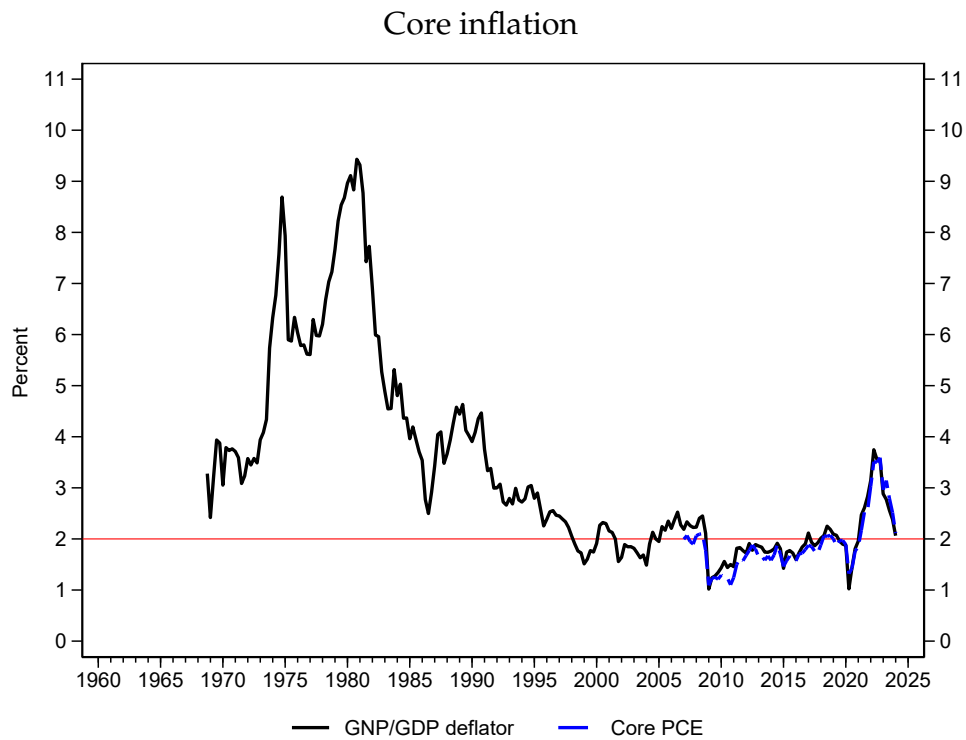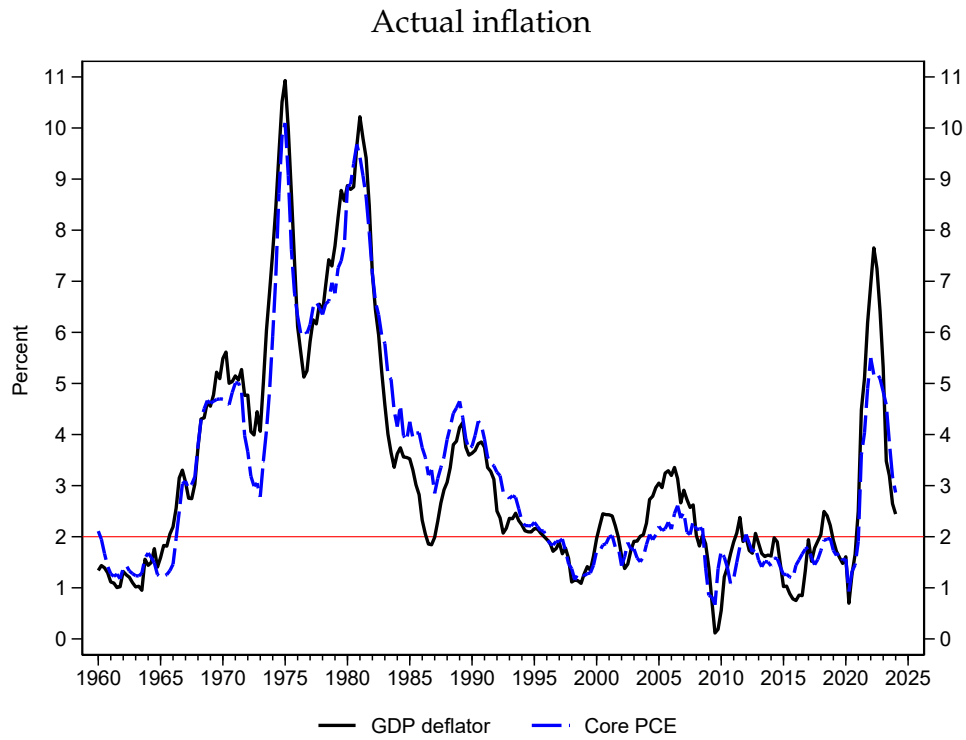
Taylor, John B., and John C. Williams (2011). Simple and Robust Rules for Monetary Policy. In Handbook of Monetary Economics, 3. Benjamin Friedman and Michael Woodford (eds). Elsevier. p. 829–859.

Qvigstad. Jan (2005). When does an interest rate path "look good"? Criteria for an appropriate future interest rate path – A practician's approach. Norges Bank Staff Memo No. 2005/6, June 2005. https://www.norges-bank.no/aktuelt/nyheter-og-hendelser/Signerte-publikasjoner/Staff-

Memo/Staff-Memo-2005/When-does-an-interest-rate-path-look-good-Criteria-for-an-appropriate-future-interest-rate-path--A-practicians-approach/

Williams, John C. (2017). Preparing for the Next Storm: Reassessing Frameworks and Strategies in a Low R-star World. FRBSF Economic Letter 2017-13, May. https://www.frbsf.org/research-and-insights/publications/economic-letter/2017/05/preparing-for-next-storm-price-level-targeting-in-low-r-star-world-speech/

Figure 1

Actual and expected inflation

Actual inflation

Core inflation

Actual inflation shown in quarter t reflects year-over-year inflation ending in quarter t. Expected inflation reflects SPF median of year-over-year inflation ending in $t+3$.
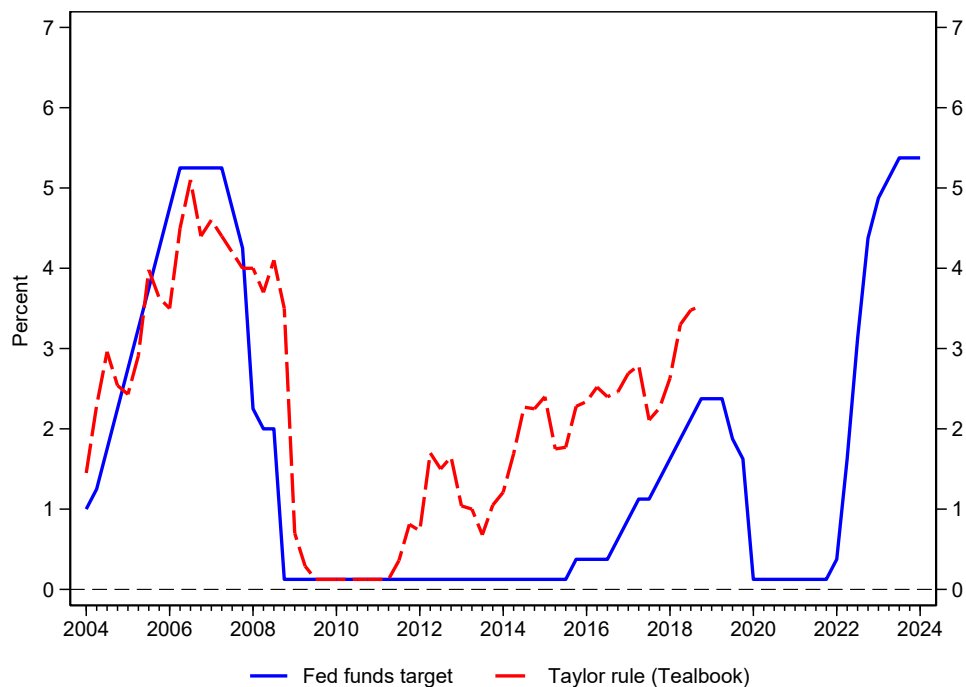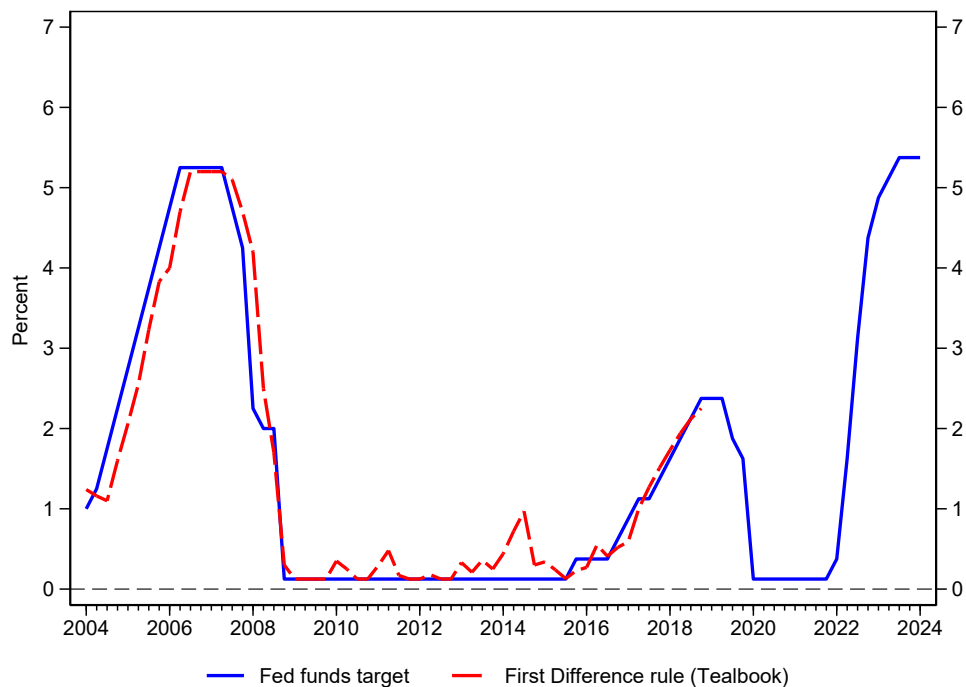
Figure 2

The post-pandemic policy error
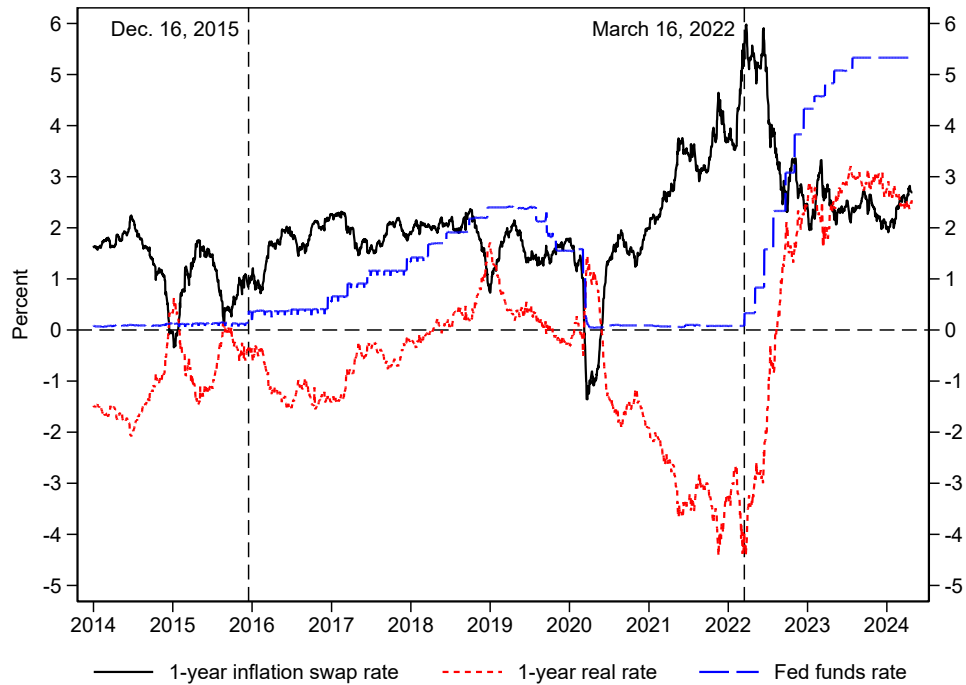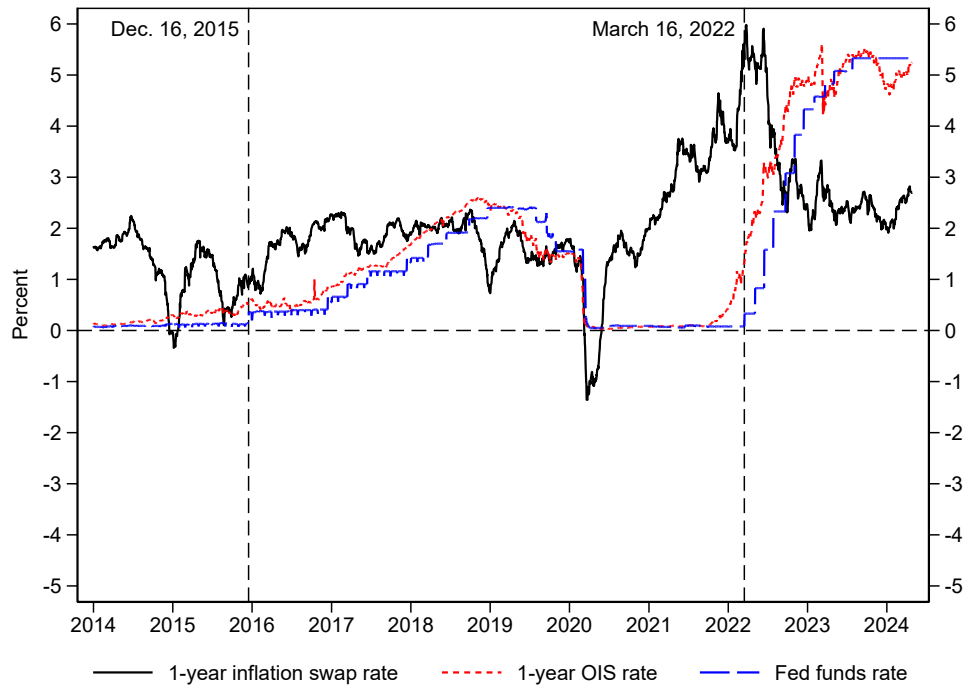
Expected inflation as measured by 1-year inflation swap rate. The real interest rate reflects the 1-year OIS rate minus the 1-year inflation swap rate.

Figure 3
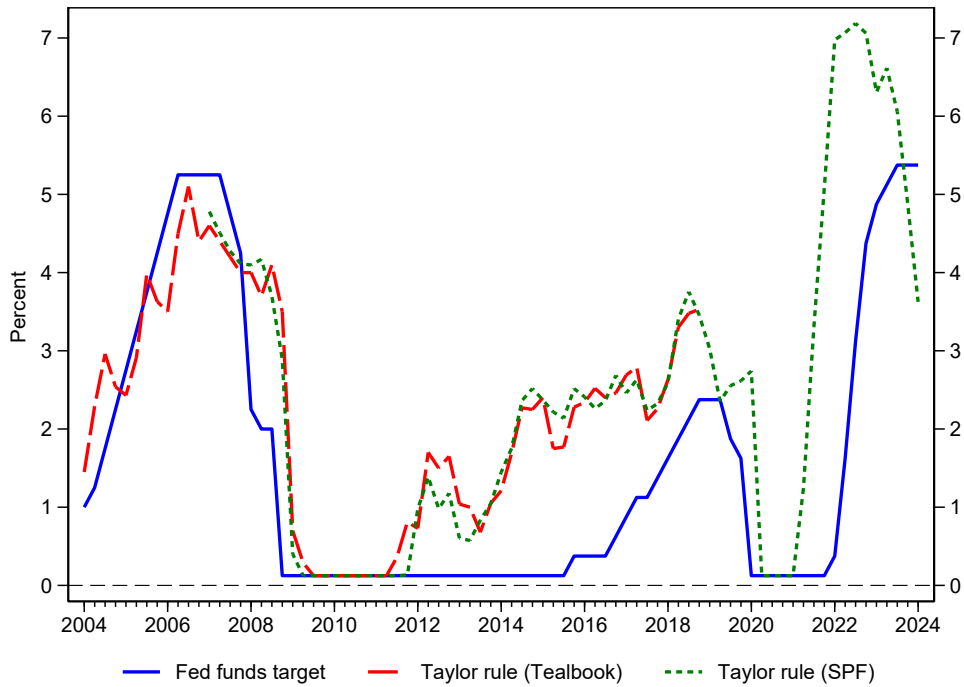**Two simple policy rules from the Fed's Bluebook/Tealbook**

Taylor rule


Natural growth rule

Fed funds target (or midpoint of target range). Rule prescriptions constrained by ZLB. Post-2018 Tealbooks not yet available to the public.

Figure 4
Two simple policy rules: Bluebook/Tealbook and SPF

Taylor rule

| Fed funds target | Taylor rule (Tealbook) | Taylor rule (SPF) |

Natural growth rule

| Fed funds target | First Difference rule (Tealbook) | Natural growth rule (SPF) |
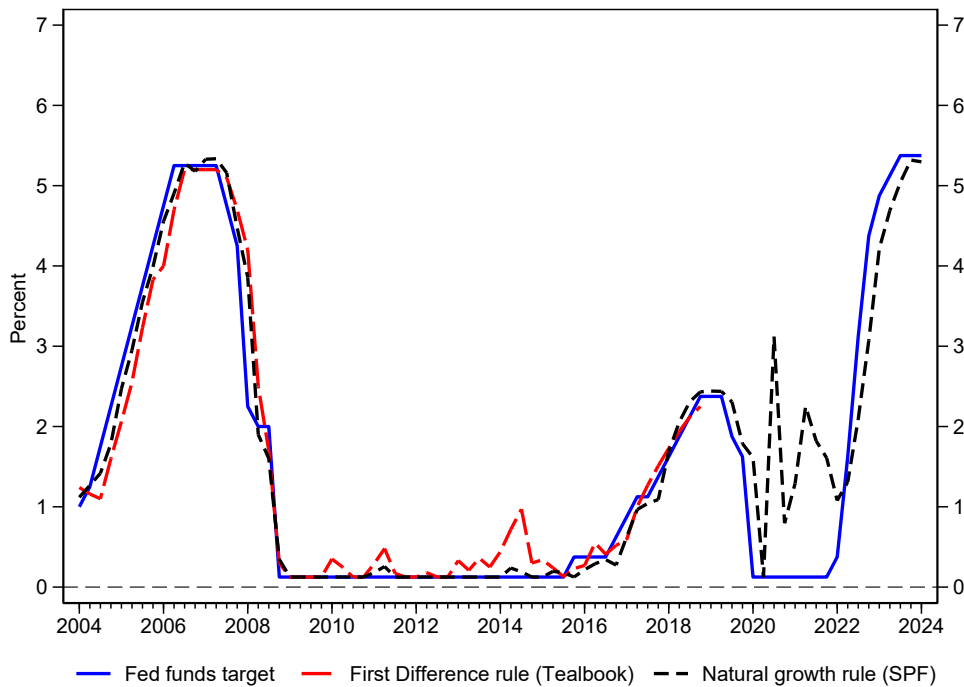
Fed funds target (or midpoint of target range). Rule prescriptions constrained by ZLB. Tealbook variants as shown in historical Bluebooks/Tealbooks. SPF variants constructed as described in text.