Following the Taylor Rule

Has the Fed Learned from Its Own "Success"?

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June 1, 2023

CATO WORKING PAPER

No. 77

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Introduction

The consensus among academics and Fed officials is that active monetary policy, following Paul Volcker's chairmanship of the Federal Reserve and continuing into the tenures of Alan Greenspan and Ben Bernanke, was partly responsible for the Great Moderation: an economic period starting from the mid-1980s and lasting until the Great Recession. During this period, many developed economies were characterized by drastic declines in the volatility of aggregate macro indicators such as output, employment, and inflation.[2]

Several papers have studied the effect of monetary policy on this increased macro stability. In a seminal publication, Clarida, Gali, and Gertler (2000) find that monetary policy was substantially more *active* (i.e., was more responsive to price changes) post-Volcker than pre-Volcker; consequently, monetary policy helped stabilize the economy in the post-Volcker period. Lubik and Schorfheide (2004) estimate a standard model of the U.S. economy for both periods and find that the post-Volcker period is better characterized with determinacy (i.e. the economy converging to a unique and stable equilibrium) while the pre-Volcker period is not. In a 2004 speech about the Great Moderation, ex-Fed Chair Ben Bernanke highlighted that "improvements in monetary policy, though certainly not the only factor, have probably been an important source of the Great Moderation," additionally noting that "the period of highest volatility in both output and inflation, was also a period in which monetary policy performed quite poorly, relative to both earlier and later periods" (Bernanke, 2004).[3]

Indeed, the evidence on this topic is mixed with the two papers discussed above supporting the role of the Fed while several others attribute the Great Moderation to other factors. For instance, Sims and Zha (2006) find empirical evidence of multiple monetary policy regimes, but ultimately conclude that "differences among regimes are not large enough to account for the rise, then decline, in inflation of the 1970s and 1980s." Stock and Watson (2003) and Ahmed, et. al. (2004) show that the stability during the Great Moderation may simply be explained through *good luck.* That is, the volatility of aggregate macro measures was low simply because the

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[2] See Davis and Kahn (2008) for an overview on this topic along with a discussion of the multitude of causes and welfare effects of this period.

[3] You may access the full speech here: https://www.federalreserve.gov/boarddocs/speeches/2004/20040220/

volatility of their constituent shocks also happened to be low during the period. Even in his speech, Bernanke conceded that factors besides monetary policy may have also contributed, stating: "[t]hree types of explanations have been suggested for [the Great Moderation] … structural change, improved macroeconomic policies, and good luck."

The present paper does not debate whether monetary policy was good or bad during the Volcker-Greenspan era or whether such "good" policy is necessary for macro stability.[4] Instead, the paper assumes, as argued by Clarida, Gali, and Gertler (2000), that Fed policy during the Volcker-Greenspan era was *good*. The paper then examines whether the Fed *continued* this good policy in the period following the Great Moderation. To this end, this paper collects the estimated Taylor Rule coefficients of the Great Moderation period from Smets and Wouters (2007) and uses them to construct an implied series for the standard Fed policy tool – the federal funds rate ("FFR"). In other words, the paper constructs the policy rate that the Fed should have targeted, as suggested by the Taylor Rule during their "successful" era of monetary policy.

The results show that the implied rate matched the realized rate closely through most of the Great Moderation, except for an overly tight policy period in the mid-90s. The two rates are also quite close prior to and during the Great Recession. However, since 2009, monetary policy has been exceptionally loose, with the Fed failing to increase the policy rate in response to macro indicators. Put differently, had the Fed followed the Taylor Rule prescription, it should have increased its policy rate – making the target FFR higher than it was – in response to positive output gaps and increases in inflation. Yet, for most of this period, the FFR is stuck at its zero lower bound when the implied rate is much higher. If the implied rate is compared to the *shadow rate*, which incorporates the use of unconventional monetary policy, Fed policy is even looser, straying as far as 8% below the Taylor Rule-implied rate.

These results follow several prior papers that also attempt to match realized Fed policy with Taylor Rule implied rates. For instance, Nikolsko-Rzhevskyy, et. al. (2014) identifies several switches between rules-based and Fed discretionary monetary regimes that occurred through modern U.S. economic history. Their analysis suggests that the Fed followed a rule from 1966 (beginning of sample) to 1974 and from 1985 to 2000, but acted discretionarily from 1974 to 1985 and from 2001 through 2013 (end of sample). Like this paper, Nikolsko-Rzhevskyy, et. al. (2014) also replaces the FFR with its shadow rate during the zero lower bound period to accurately capture monetary policy. The results presented in this paper largely concur with their findings. Additionally, their paper shows that economic performance is always better under a rules-based regime, but the degree of benefits to consumer welfare depends on the type of rule being followed.

Similarly, John Taylor (2012) himself demarcates two eras: a rules-based period from 1985 to 2003 and an ad-hoc discretionary period following 2003. He also concludes that economic performance is decidedly worse when the Fed uses an ad-hoc approach to interest rate decisions. As this paper will show, the departure from rules-based policymaking has only exacerbated since the early 2010s, when these studies last discussed the benefits of using the Taylor Rule. In fact, at no point since 1984 has the deviation between Taylor Rule implied and

[4] See Selgin, Lastrapes, and White (2012) for a detailed discussion of the Fed's historical failures.

realized rates been as large as the current era, post the Covid-19 pandemic.

These papers, along with the results shown here, raise several concerning questions regarding the Fed's recent conduct of monetary policy. A rules-based policy rate offers several advantages: Fed decisions are easily communicated, Fed decisions are more predictable thereby making inflation expectations easier to anchor, and a universal policy rule is robust to mistakes in identifying the underlying model of the U.S. economy (known as model misspecification). Given these benefits, serious departures from the Taylor Rule are concerning; why, for example, did the Fed abandon rules-based monetary policy since the end of the financial crisis?

Given that adherence to a standard Taylor Rule, with a strong response to inflation, helped stabilize the U.S. economy it is natural to ask whether the sharp recent deviations from the rule have caused instability. Richard Clarida, an author of the seminal paper highlighting the Fed's role in stabilizing the economy during the Great Moderation, also served as the Fed's Vice Chair from 2018 to 2022 – the period when monetary policy most differed from its successful and stabilizing Taylor Rule. Again, it is unclear why the Fed has switched its stance towards discretionary policymaking when acknowledging itself that such rules-based governance helped achieve determinacy (stability) in the U.S. economy to begin with. Naturally, this raises the question: has the economy descended into indeterminacy (instability) since the Fed abandoned a rules-based approach?

Finally, as discussed above, periods when the Fed has adopted a rules-based approach have led to welfare increasing outcomes. Discretionary periods have typically resulted in lower consumer welfare. The recent monetary era marks the largest and longest deviations from the Taylor Rule since 1984, so it is natural to ask whether this change resulted in welfare losses for consumers. While this paper only offers evidence of the Fed's sharp departure from the Taylor Rule, future Cato papers may address these outlying questions in further detail.

1. The Taylor Rule

The Taylor Rule, formulated by economist John B. Taylor in 1993, serves as a guide for establishing the optimal federal funds rate—the inter-bank lending rate the Federal Reserve tries to influence to reach its policy goals. This rule aims to systematically connect monetary policy to inflation and economic output, thereby enabling central banks to respond effectively to economic fluctuations. Although the Federal Reserve is not compelled to strictly adhere to the Taylor Rule, it has been employed as a benchmark for comprehending and conveying monetary policy decisions (Bernanke, 2010). The rule offers a straightforward and transparent structure that has been instrumental in guiding discussions about monetary policy rules and strengthening the accountability and credibility of central banks (Yellen, 2012).

The rule posits that central banks should increase interest rates when inflation (π_t) spikes or when the economy as measured by real output (y_t) operates above its potential capacity (y_t^p). Conversely, interest rates should be reduced when inflation falls or when the economy operates below its potential (Taylor, 1993). Given that the Fed does not like to make drastic sudden changes to the policy rate, usual formulations of the rule incorporate interest rate *smoothing*. Under this method, the current FFR (r_t) is pegged to the prior quarter r_{t-1} to some degree (ρ) to prevent overtly drastic policy changes. Here is a "classic" formulation of the rule:

$$r_t = \rho\, r_{t-1} + (1-\rho)\left[r_\pi \pi_t + r_y\left(y_t - y_t^p\right)\right] + \varepsilon_t \quad (1)$$

where r_π and r_y are the degrees to which the Fed responds to current period inflation and output gap respectively and ε_t is a per-period, serially uncorrelated, monetary policy shock that is distributed $N[0, \sigma^2]$.

It may be immediately clear that the choice of response coefficients, r_π and r_y, are extremely important in governing the progression of the policy rate. Standard calibration choices for these parameters are usually 1.5 and 0.5 respectively, corroborating the Fed's primary motivation to combat inflation. However, these choices reflect the views of academics of what *should* constitute good policy. It does not necessarily capture what the exact measure of such coefficients were during the Great Moderation. Additionally, this classic formulation is usually appended to very simple models of the business cycle. For a full treatment, it is important to look towards the Smets and Wouters (2007) paper ("SW2007").

SW2007 is a highly cited and influential paper that has since become a benchmark model in macroeconomics. It is classified as "medium-scale" as it elevates the base new-Keynesian DSGE model with several desirable features while remaining mathematically tractable. Some of these features include: habit formation, price and wage indexation, variable capital utilization, and investment adjustment costs. The model is then fitted to the actual U.S. economy using seven macro time series and a Bayesian Markov Chain Monte Carlo (MCMC) algorithm to estimate the actual values of the structural coefficients, including monetary policy parameters. SW2007 uses a marginally modified version of equation (1) presented above to account for Fed responses to changes in the output gap overall. Here is the SW2007 Taylor Rule:

$$r_t = \rho\, r_{t-1} + (1-\rho)\begin{bmatrix} r_\pi \pi_t \\ + r_y\left(y_t - y_t^p\right) \end{bmatrix} + r_{\Delta y}\begin{bmatrix} \left(y_t - y_t^p\right) - \\ \left(y_{t-1} - y_{t-1}^p\right) \end{bmatrix} + \varepsilon_t \quad (2)$$

This paper uses the estimated coefficients from equation (2) above to compute the FFR that is implied by the SW2007 Taylor Rule for the period including *and* after the Great Moderation. The methodology for this analysis is described in the following section.

2. Data and Methodology

The purpose of this paper is to compare actual U.S. monetary policy, as measured through the realized policy rate, with the Taylor Rule from the "successful" period of Fed policy during the Great Moderation. In other words, assuming the Fed successfully implemented monetary policy during the Great Moderation, this paper examines whether they followed that successful rule through to the present. To this end, policy rule coefficients are collected from the SW2007 paper; that analysis is conducted for three data samples: full period from Q1 1966 to Q4 2004, pre-Volcker period from Q1 1966 to Q2 1979, and a post-Volcker (Great Moderation) period from Q1 1984 to Q4 2004.

The posterior modes for the policy rule coefficients from each of these periods are reported in Table 1.[5] The values show that the

[5] In the Bayesian estimation literature, it is standard to report posterior means instead of modes. However, SW2007 only report the posterior mean for the full period and not for the sub-periods. Since the post-Volcker sub-sample is of key interest, the posterior modes are compared here. This is likely going to have negligible impact on the analysis as the posterior means and modes are usually very close in value and

traditional narrative of the Fed's stronger response to inflation after Paul Volcker's chairmanship is only marginally true; its response to inflation is 1.77 during the Great Moderation but its response pre-Volcker is similar at 1.65. The key change in Fed policy from pre- to post-Volcker is its diminished response to output gap: it is 0.08 post-Volcker but over twice as high at 0.17 pre-Volcker.

Coefficient	*Full Period*	*Pre-Volcker*	*Great Moderation*
ρ	0.81	0.81	0.84
r_π	2.03	1.65	1.77
r_y	0.08	0.17	0.08
$r_{\Delta y}$	0.22	0.20	0.16

Table 1: Taylor Rule Coefficient Estimates – Smets and Wouters (2007)

This paper then uses the coefficients from the Great Moderation period to estimate the implied policy rate. Note that this choice produces a more conservative estimate for the implied policy rule than the use of the full period coefficients. Quarterly inflation is computed using the core PCE price index, the Fed's preferred measure (Yellen, 2015), as follows:[6]

$$\pi_t = \log\left[\frac{Core\ PCE_t}{Core\ PCE_{t-1}}\right] \times 100\% \quad (3)$$

Output gap is computed using real GDP as well as real potential GDP[7] as follows:

$$y_t - y_t^p = \log\left[\frac{Real\ GDP_t}{Real\ Potential\ GDP_t}\right] \times 100\% \quad (4)$$

Note that the SW2007 model is written as log deviations from steady state so all inflation and output gap data is demeaned prior to the analysis. The final value for the implied rate is computed using equation (2) above and the coefficient values for the Great Moderation from Table 1. Since this process generates a demeaned implied rate, the mean of the FFR from this period (3.53%) is added back to the constructed implied rate to generate the final "SW2007 Implied FFR" for easier comparison. Initial conditions are set so that the implied and realized rates are the same in Q1 1984. The federal funds rate is chosen as the primary metric of the *realized* policy rate.

However, since this paper is primarily concerned with post-Moderation policy, interest rates are at their zero lower bound ("ZLB") for an extended period. As such, the Fed resorted to unconventional monetary policy – including Quantitative Easing (QE) by purchasing long-term assets – instead of focusing solely on short-term interest rates. To capture the true stance of monetary policy in this period, the *shadow rate* from Wu and Xia (2016) is used (henceforth "WX FFR"). WX FFR estimates the underlying stance of monetary policy when short-term interest rates are at or near zero. Their technique incorporates information from the yield curve and Treasury bond futures option prices to

the same is true here for the full sample (see Table 1A in SW2007).

[6] Unless specified otherwise, all data for this analysis is collected from the FRED website for the period from Q1 1984 to Q4 2022.

[7] Potential real GDP is an inflation-adjusted estimate of the U.S. economy's maximum level of sustainable output. It is computed by the U.S. Congressional Budget Office. When GDP is below potential, the economy is not using all its available resources. When GDP is above potential, the economy is "overheating" and operating at an unsustainable level. Standard economic theory establishes that deviation from potential in either direction hurts consumer welfare, thereby factoring into the Fed's stabilization decisions.

construct a measure of the shadow short-term interest rate, since financial markets provide valuable signals about future interest rate expectations in the absence of policy rate changes. The resulting shadow rate provides an estimate of the effective interest rate that would prevail in the absence of the ZLB constraint. This paper compares the SW2007 Implied FFR to the base FFR as well as the WX FFR.

A separate issue, as Orphanides and Williams (2002) show, is that policymakers do not know the values of natural rates of output/unemployment/etc. in real time as they make policy decisions, making it difficult to know the correct values of potential GDP when setting rate targets. For robustness, this paper also computes the implied rate using an alternate specification of the Taylor Rule. In this formulation, taken from Milani (2017), the Fed responds directly to output deviations from technology shocks (ε_t^a) instead of potential output. Additionally, instead of the first difference of output gap, policymakers respond to the first difference of output (mathematically equivalent to the growth rate of real GDP).

This Taylor Rule specification is as follows:

$$r_t = \rho\, r_{t-1} + (1-\rho)\begin{bmatrix} r_\pi \pi_t + \\ r_y\left(y_t - \phi_p \varepsilon_t^a\right) \\ + r_{\Delta y}(y_t - y_{t-1}) \end{bmatrix} + \varepsilon_t \quad (5)$$

where ϕ_p is the degree of fixed costs in production and is calibrated to its SW2007 Great Moderation value of 1.54. All other parameters have the same interpretation and values as listed previously. Technology shocks are measured using the Fernald (2014) quarterly TFP series as well as the utilization adjusted TFP series for further sensitivity.[8] These sensitivity analyses are discussed but the results are not fully presented. They do not alter any conclusions and are available upon request.

3. Policy Rate Comparison

Figure 1 compares the interest rate as implied by SW2007 to the realized FFR and the Wu and Xia (2016) shadow FFR. The figure also shows the tenures of the various Fed chairs from 1984 through 2022, beginning with Paul Volcker and continuing through current Fed chair Jerome Powell. Figure 2 shows the spread between the implied and realized rates (both FFR and WX FFR) for this period. Additionally, Table 2 shows the correlations between the SW2007 implied rate and the FFR as well as its correlation with the shadow rate (the base FFR is used when the shadow rate is unavailable).

It is immediately clear from Figure 1 that Fed policy decisions are markedly different after Q2 2009, i.e., in the aftermath of the financial crisis and the recession it triggered. Prior to 2009, the actual FFR closely follows the implied rule in most periods, with the major exception between the two rates occurring from the mid-90s to early-00s. In this period, under the Greenspan era, monetary policy was too tight, usually about 2 percentage points higher than SW2007 implies. However, the movements between the rates seemed to match quite well, suggesting that the difference was primarily caused by disagreements about the mean or steady-state interest rate. This co-movement is captured by computing correlations, which

[8] For information on why such utilization adjustments are necessary and how they are conducted, see Basu, Fernald, and Kimball (2006).

measures the degree of commonality in the variance of two variables. Since variance is measured as deviation from the mean, significant differences in the mean of the two variables may still result in their variances closely matching. As Table 2 shows, actual policy was still highly correlated with the SW2007 rate with a coefficient of 0.78, the highest of any Fed chair since Volcker.

	Range	*Correlation FFR*	*Correlation WX FFR*
Full	Q1 1984 to Q4 2022	0.79	0.76
Great Moderation	Q1 1984 to Q4 2004	0.84	0.85
Post-SW2007	Q1 2005 to Q4 2022	0.54	0.42
Paul Volcker	Q1 1984 to Q3 1987	0.92	0.92
Alan Greenspan	Q4 1987 to Q4 2005	0.76	0.78
Ben Bernanke	Q1 2006 to Q4 2013	0.87	0.75
Janet Yellen	Q1 2014 to Q4 2017	0.49	0.17
Jerome Powell	Q1 2018 to Q4 2022	0.26	-0.02

Table 2: Correlations between Realized and Rule-Implied Federal Funds Rates

See Figure 3 for an out-of-sample, zoomed-in, comparison of interest rates after Q4 2004 (i.e., after the end of the SW2007 dataset); this figure specifically allows for a comparison of rates after the Great Moderation. Figure 3 shows Fed policy mirrored the Taylor Rule remarkably well in the mid-2000s, during the build-up to the financial crisis and through its onset (this period marks the end of Greenspan's tenure and the first half of Ben Bernanke). However, beginning in Q2 2009, coinciding with the official end of the Great Recession,[9] monetary policy drastically differs from the Taylor Rule. As close as the FFR was to the implied rule at the start of Bernanke's tenure, it was just as far apart in the latter half. This divergence continued through Janet Yellen's tenure, only returning to reasonable proximity in 2019, after a decade of loose monetary policy.

The discrepancy is especially stark when comparing the implied rule to the shadow rate. During this period, with interest rates stuck at the ZLB, the Fed resorted to unconventional monetary policy such as quantitative easing. While this is obfuscated by the base FFR, the shadow FFR clearly shows that monetary policy kept *easing* when the model-based rule suggested increased *tightening*. As Figure 2 shows, the implied-realized spread during this period was historically large. From 2013 to 2015, the shadow FFR is almost always 3+ percentage points below the model-implied rate; the spread often crosses the 4-percentage point mark and goes as high as 5.21% in Q3 2014.

[9] The NBER keeps a historical record of U.S. business cycles. It marks "June 2009 (2009Q2)" as the end of the late 2000s recession. Access it here: https://www.nber.org/research/data/us-business-cycle-expansions-and-contractions.

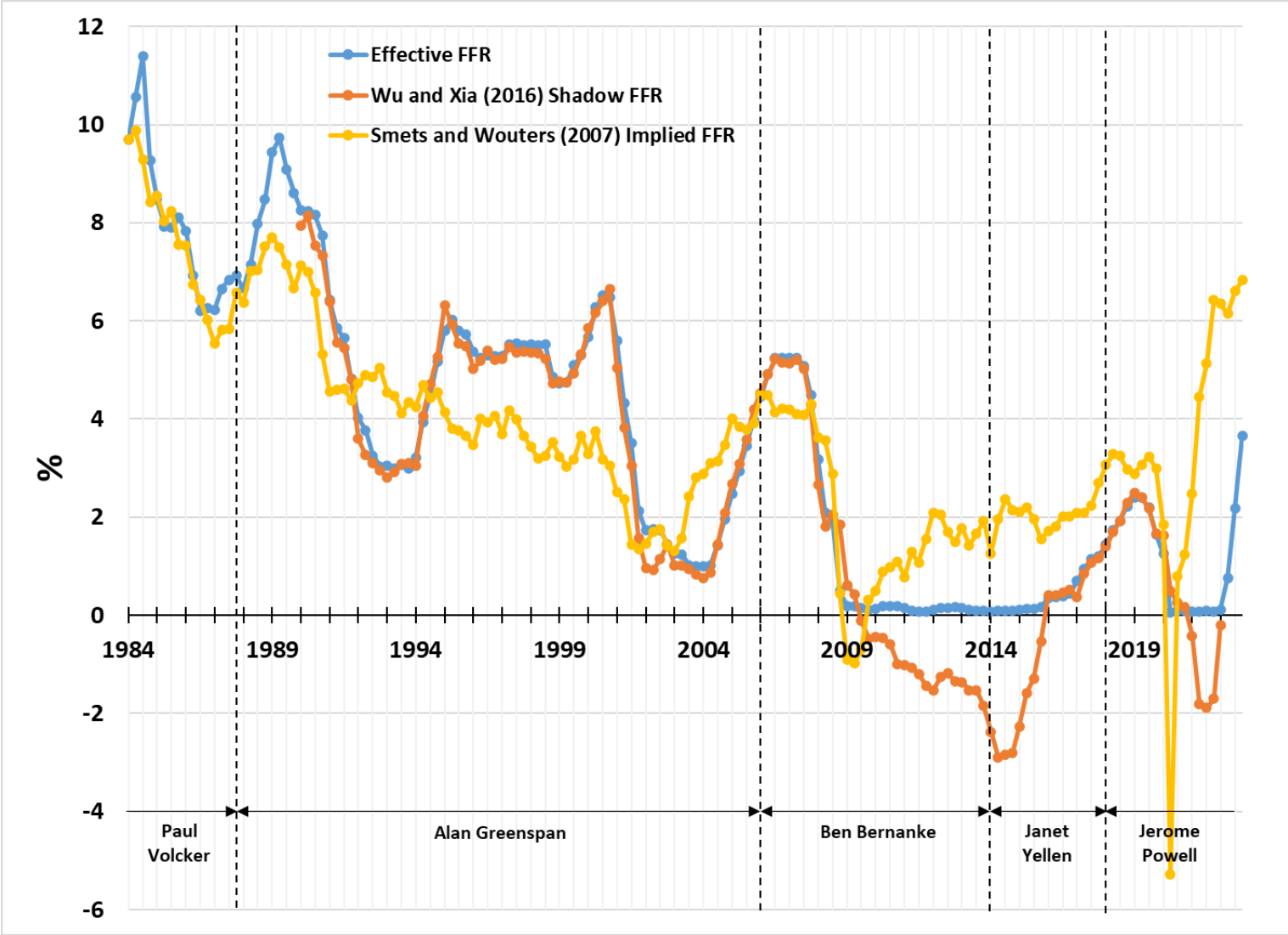

Figure 1: Realized v. Rule-Implied Federal Funds Rates – Full Period (Q1 1984 to Q4 2022)

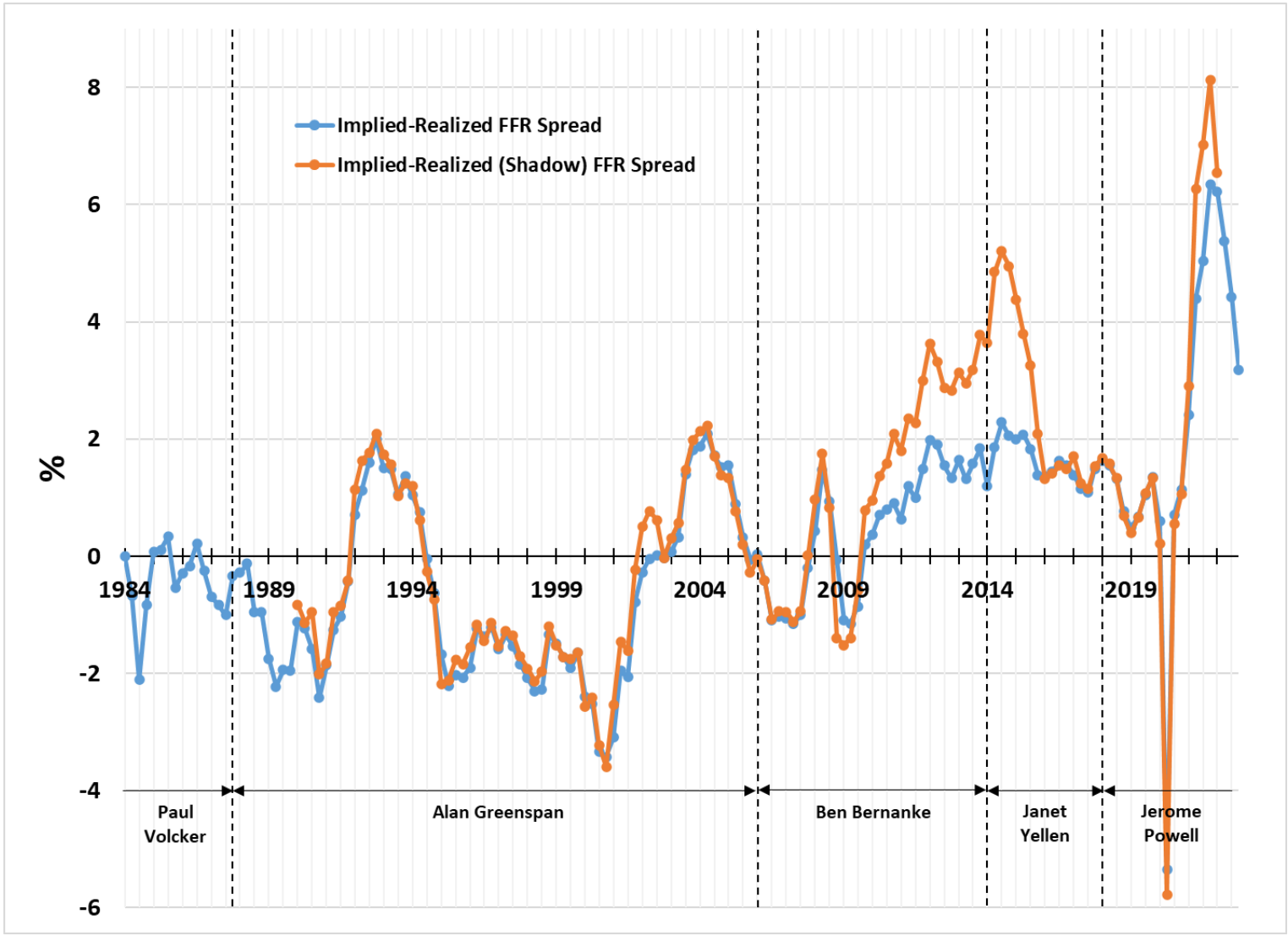

Figure 2: Spread between Rule-Implied and Realized Federal Funds Rates – Full Period (Q1 1984 to Q4 2022)

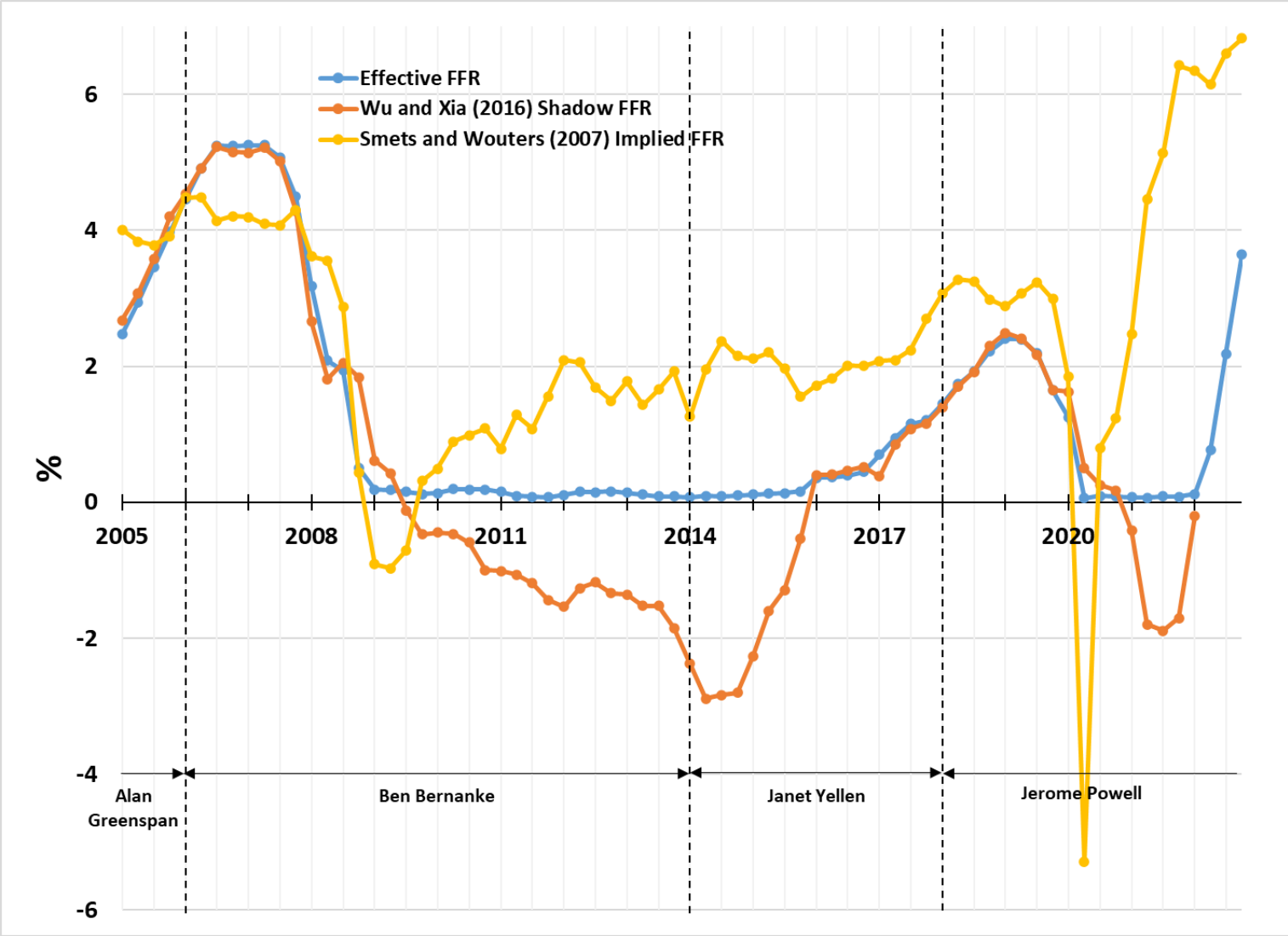

Figure 3: Realized v. Rule-Implied Federal Funds Rates – Post Great Moderation (Q1 2005 to Q4 2022)

Monetary policy changes became increasingly uncorrelated with the Taylor Rule in this period. During the Great Moderation (defined as Q1 1984 to Q4 2004), actual Fed policy and the Taylor Rule closely matched, exhibiting a correlation of 85%. Since the ZLB masks most interest rate effects in the latter half of the Bernanke era, correlation between the FFR and SW2007 implied rate *appeared* higher during his chairmanship (0.87) compared to Alan Greenspan (0.76). However, their correlations are roughly the same (0.78 and 0.75, respectively) when accounting for unconventional monetary policy. Under Yellen's tenure, monetary policy sharply deviated from the Taylor Rule. Correlation between the implied and realized rates fell to only 17%, nearly 60 percentage points lower than the prior regime.

While each successive Fed administration adhered to successful rules-based policy making less than their predecessor, under the current regime the implied and realized rates are completely dissociated. Admittedly, this period includes the Covid-19 economy-wide shutdowns and the resulting inflation from supply shortages, government spending, etc., increasing the difficulty of accurately changing the policy rate. However, the need for good policymaking was equally strong, with an increasingly turbulent economy and the largest inflationary spike since the late 1970s. As Figure 3 shows, the Fed did not follow its optimal Taylor Rule from the Great Moderation. Setting aside Q2 2020 as an anomaly, where the implied rate was an unrealistic -5.29%,[10] the Fed performed poorly during and after the Covid crisis.

The primary error was the Fed's sluggish response to rising inflation. SW2007 indicates that the policy rate should have started increasing from its ZLB by Q4 2020 while the Fed waited more than 20 months, only beginning to increase the target FFR in Q2 2022. Not only was the response sluggish, but the shadow rate also reveals that during the steady rise in inflation, the Fed *lowered* the effective FFR via unconventional monetary policy. This resulted in an implied-realized spread of over 6% between Q2 2021 and Q1 2022. In Q4 2021, the effective FFR is 8.13% lower than the optimal value, the highest dispersion recorded in the entire data sample. Table 2 confirms the dissociation between the Fed's actual policy and its successes from the Great Moderation. Compared with the shadow rate, the realized and implied FFRs are virtually *uncorrelated* with a coefficient of just -0.02.

All results discussed above hold, even if the formulation of the Taylor Rule is switched from equation (1) to (5) so that the Fed responds to deviation of output from technology shocks instead of potential GDP. The analyses look similar except that when responding to technology shocks, the Q2 2020 anomaly does not occur as the economy shutdown is captured by the technology shock but potential output is unaffected even under the Covid crisis. Since the Fed responds to deviation of output from either potential or TFP shocks, when output falls dramatically with no change to potential, it requires an unreasonably large interest rate response. However, since lockdown effects are captured under TFP shocks, both output and TFP fall by similar amounts, keeping their difference small and in turn requiring a subdued interest rate change. The same holds true for both measures of TFP: base and utilization adjusted as per Basu, Fernald, and Kimball (2006).

[10] The U.S. real GDP in this quarter was 11.45% below potential, the largest recorded value, because of the sudden Covid-19 lockdown. This is correspondingly reflected in the implied rate being -5.29%.

Conclusion

Throughout its history, the Fed has operated within a purely discretionary policy framework, and many economists have argued that a rules-based monetary policy would improve economic outcomes. Defenders of discretion-based policy claim that the enormous complexity of the ever-changing economy requires broad discretion, but the nature of the economy makes the case for rules-based policy. Even at the operational level, conventional economic theory suggests that the Fed should adjust its policy stance based on a limited number of economic relationships, such as the link between inflation and potential output. If the Fed is regularly adjusting its stance based on these standard relationships, explaining its reasoning should not be controversial. On the other hand, if the Fed is not adjusting its policy stance based on these relationships, it is not clear why a group of specialists is required to set the stance of monetary policy.

Additionally, the fact that the economy is ever-changing *increases* the need for rules-based governance, not the other way around. This increased need arises because a policy rule, such as the Taylor Rule framework, is robust to incorrectly identifying the underlying model of the economy. Economic theory predicts that even small changes in the central bank's policy rate using a model that deviates from the true structure of the economy can have drastic effects on the outcomes of macro fundamentals. Under a rule, Fed policy is never wholly correct but is also never drastically off target. Unsurprisingly, research corroborates that the Fed's most successful period, as measured through both consumer welfare gains and macro stability, occurred when the FOMC was following a conventional Taylor Rule.

This paper compares Fed policymaking to its "successful" counterpart from the period known as the Great Moderation. The results show that the Fed has departed significantly from rules-based governance and this departure has worsened with each successive administration. Especially in the aftermath of the financial crisis, Fed policy was exceptionally loose compared to the Taylor Rule prescription, including multiple periods where the Fed kept easing rates when the successful rule suggested significant tightening. At its peak, the federal funds rate was over 8 percentage points away from the rule that the Fed used during the post-Volcker period, the era that the Fed itself claims was characterized by good policymaking.

These findings raise several important and concerning questions, some of which may be addressed in forthcoming papers: (i) why has monetary policy deviated so strongly from the Taylor Rule in the recent past? (ii) if good policy was important for stability, has this deviation caused instability? and (iii) could the Fed have significantly raised welfare and economic performance by sticking to its "successful" rule?

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