Policy Rule Forward Guidance Following the Covid-19 Recession

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Abstract

The Federal Open Market Committee recently adopted a far-reaching revised Statement on Longer-Run Goals and Monetary Policy Strategy. The two major changes are that the Committee will implement flexible average inflation targeting and will mitigate *shortfalls*, rather than *deviations*, of employment from its maximum level. At its September meeting, the Committee approved enhanced forward guidance, which maintains the federal funds rate at the effective lower bound until maximum employment is achieved and inflation has risen to 2 percent and is on track to moderately exceed 2 percent for some time. We first show how policy rules could be modified to be consistent with the revised statement and included in future Monetary Policy Reports. We then propose policy rule forward guidance as an alternative mechanism for the Committee to communicate the eventual exit from the effective lower bound and beyond which is consistent with both the revised statement and the Committee's projections through 2023. In contrast with enhanced forward guidance, policy rule forward guidance removes accommodation as the economy improves. We describe scenarios with average, fast, and slow recoveries to illustrate how policy rule forward guidance could work in practice.

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1. Introduction

The Federal Open Market Committee (FOMC) adopted a far-reaching revised Statement on Longer-Run Goals and Monetary Policy Strategy in August 2020. The framework contains two major changes. First, while policy decisions will still seek to mitigate *deviations* of inflation from its longer-run goal, they will now attempt to mitigate *shortfalls*, rather than *deviations*, of employment from its maximum level. Second, the FOMC will implement Flexible Average Inflation Targeting where, "following periods when inflation has been running persistently below 2 percent, appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time."[1]

In the Summary of Economic Projections (SEP) released following the September 2020 FOMC meeting, the median projection of the members for the federal funds rate (FFR) was 0.1 percent through the end of 2023. The Committee also provided enhanced forward guidance, saying that it expects to maintain the target range of the FFR at the effective lower bound (ELB) of 0 to ¼ percent "until labor market conditions have reached levels consistent with the Committee's assessment of maximum employment and inflation has risen to 2 percent and is on track to moderately exceed 2 percent for some time."[2] In an interview a week after the meeting, Vice Chair Richard Clarida reiterated that policymakers "are not even going to be thinking" about raising rates until observed inflation has reached at least 2 percent and labor market indicators are consistent with maximum employment. He did not discuss how the Committee would respond to inflation overshooting its 2 percent target, calling such decisions "academic" at this point.[3]

Robert Kaplan of the Dallas Fed voted in favor of the revised statement but against the monetary policy action that contained the enhanced forward guidance on the basis that he "expects that it will be appropriate to maintain the current target range until the Committee is confident that the economy has weathered recent events and is on track to achieve its maximum employment and price stability goals as articulated in its new policy strategy statement, but prefers that the Committee retain greater policy flexibility beyond that point." In Kaplan (2020), he expanded on his views by emphasizing the distinction between "accommodative" policy and keeping rates at zero as the economy comes close to achieving the FOMC's dual mandate objectives. He also

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[1] See Federal Open Market Committee (2020a).
[2] See Federal Open Market Committee (2020b).
[3] See Schneider (2020).

discussed the costs of keeping rates at zero for prolonged periods, including adversely impacting savers, encouraging excessive risk taking, and creating distortions in financial markets. The minutes of the September 2020 meeting indicate that these concerns were shared by several other FOMC members.[4]

This paper proposes an alternative to enhanced forward guidance, which we call "Policy Rule" forward guidance, and analyzes how the FOMC could implement it for the period following the Covid-19 recession. Policy rule forward guidance uses a policy rule to structure expectations and increase predictability about the future path of the federal funds rate, conditional on realized values of inflation and unemployment. It is "outcome-based" forward guidance that does not make an unconditional commitment to a single interest rate path.[5] In common with all policy rules, it provides a benchmark for the path of the FFR, not a commitment to set an exact rate based on inflation and unemployment realizations. Policy rule forward guidance is in accord with Clarida's answer to the first question following his speech several days after adoption of the statement that "rules are an essential input into the policy process for thinking about options and communications." [6]

The key difference between policy rule forward guidance and enhanced forward guidance is that the former, but not the latter, removes accommodation as the economy improves. Kaplan (2020) emphasizes the distinction between "accommodative" and "zero". As the economy approaches its dual mandate objectives of maximum employment and inflation moderately above 2 percent, the neutral nominal interest rate, the FFR which is neither accommodative nor restrictive, will increase as inflation rises. Policy rule forward guidance prescribes raising the FFR faster than the neutral FFR. This reduces accommodation so that, when the dual mandate objectives are attained, there is no need for further policy changes to achieve the neutral rate. Enhanced forward guidance, in contrast, prescribes keeping the FFR near zero. This increases accommodation so that, when the dual mandate objectives are attained, it would require a large increase in the FFR to achieve the neutral rate. This is not in accord with the FOMC's incremental approach to raising rates, which casts doubt on whether future Committees will choose to maintain the FFR at the ELB for that long.

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[4] See Federal Open Market Committee (2020c).
[5] Federal Open Market Committee (2020c) contains a discussion of outcome-based forward guidance.
[6] See Fed Vice Chair Richard H. Clarida on U.S. Monetary Policy | Event | PIIE

We proceed in three stages. First, we construct policy rules that adhere to the revised Statement on Longer-Run Goals and Monetary Policy Strategy. Second, we develop versions of the rules that are consistent with the median inflation, unemployment, and federal funds rate projections through the end of 2023 from the September 2020 SEP, but not with the commitment to keep the FFR at the ELB thereafter. Third, we describe scenarios with average, fast, and slow recoveries to illustrate how policy rule forward guidance could work in practice.

Policy rules are generally used to conduct normative analysis of monetary policy, either by comparing actual and prescribed federal funds rate over different rules and/or times, as in Taylor (1999), or by calculating optimal rules for one or more macroeconomic models, as in Taylor and Wieland (2012). We are using policy rules in a completely different context. Our only criteria for choosing a policy rule to provide forward guidance is that the rule be in accord with the revised statement and median SEP projections, not whether it is optimal or performs better than other rules.

We start by considering two policy rules that are consistent with the original 2012 statement. The Taylor (1993) rule prescribes that the FFR equal the inflation rate plus 0.5 times the inflation gap, the difference between the inflation rate and the 2 percent inflation target, plus 1.0 times the unemployment gap, the difference between the rate of unemployment in the longer run and the realized unemployment rate, plus the neutral real interest rate.[7] The "balanced approach" rule in Yellen (2012) raises the coefficient on the unemployment gap to 2.0 while maintaining the coefficient of 0.5 on the inflation gap.

We modify the policy rules to be in accord with the revised 2020 statement. First, we replace the rate of unemployment in the longer run with the unemployment rate consistent with maximum employment, and base FFR prescriptions on shortfalls instead of deviations. Second, if inflation rises above 2 percent, the rule is amended to allow it to equal the inflation rate "moderately" above 2 percent that the FOMC is willing to tolerate "for some time" before raising rates in order to bring inflation down to the 2 percent target. We examine how these changes affect the prescriptions in the February 2020 Monetary Policy Report and show that the prescribed exit from the effective lower bound following the Great Recession is extended by two years with the Taylor rule and five quarters with the balanced approach rule.

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[7] While policy rules are usually written in terms of the output gap, the percentage deviation of GDP from potential GDP, we use the unemployment gap for consistency with the Fed's Monetary Policy Reports and the focus on maximum employment in the revised statement.

Implementing policy rule forward guidance following the Covid-19 recession requires specifying values for the neutral real interest rate, which we set at 0.5 percent in accord with the September 2020 SEP, the unemployment rate consistent with maximum employment, which we set at 3.0 percent to reflect the FOMC's willingness to lower the unemployment rate beyond the 3.5 percent level at the end of 2019, and inflation moderately above 2 percent, which we set equal to 2.4 percent for consistency with flexible average inflation targeting conditional on SEP inflation projections through 2023 and our projections thereafter. We focus attention on the balanced approach rule because the Taylor rule is not consistent with the SEP projection that the federal funds rate will remain at the effective lower bound through the end of 2023.

We illustrate several scenarios for how policy rule forward guidance could be used to make policy more systematic. First, we use the median projections through the end of 2023 from the September 2020 SEP and assume that unemployment will fall and inflation will rise thereafter at decreasing rates. Using the balanced approach rule, the projected exit date from the ELB is 2024:Q1.[8] Next, we use the high and low values from the central tendency, which excludes the three highest and lowest projections for each variable. We define a "fast" recovery by taking the lowest unemployment rates and the highest inflation rates and a "slow" recovery by taking the highest unemployment rates and the lowest inflation rates from the central tendency. The exit dates are 2023:Q1 for a fast recovery and 2025:Q1 for a slow recovery. The results illustrate the difference between accommodative and near-zero interest rate policy. As unemployment falls and inflation rises towards the dual mandate objectives, policy rule forward guidance prescribes regular federal funds rate increases. Enhanced forward guidance, in contrast, prescribes an FFR of between 0 and 0.25 percent.

Levy and Plosser (2020) argue that the revised statement will likely lead to more discretionary and, therefore, less predictable or systematic monetary policymaking. Taylor (2020) advocates that average inflation targeting should be rules-based, saying that "the Fed could still switch to an average-inflation approach and yet be far more specific than it has decided to be." We show how policy rules could be modified for consistency with both flexible average inflation targeting and mitigating shortfalls from maximum employment, describe how the modified rules would affect the prescriptions in the Monetary Policy Report, and construct scenarios for how the rules could be used to provide forward guidance following the Covid-19 recession.

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[8] While the data is annual, we interpolate to calculate quarterly exit dates.

2. Revised Statement on Longer-Run Goals and Monetary Policy Strategy

The two most important features of the revised statement are that (1) policy will attempt to mitigate shortfalls of employment from its maximum level and (2) the strategy has evolved "from flexible inflation targeting to flexible average inflation targeting".[9] Figure 1 provides a pictorial representation of the new framework. Inflation is on the vertical axis, with $\pi = 2$ representing the FOMC's inflation target and $\pi = \pi^{\text{Max}}$ representing the highest inflation rate before the FOMC will start to raise rates for the purpose of reducing inflation following periods when inflation has been running persistently below 2 percent. The statement, however, is silent on how inflation is to be brought down. In the spirit of mitigating deviations of inflation from its longer-run goal, we define $\pi = \pi^{\text{Min}}$ as the lowest inflation rate before the FOMC will start to lower rates for the purpose of raising inflation following periods when inflation has been running persistently above 2 percent. We assume that $\pi^{\text{Min}} < 2 < \pi^{\text{Max}}$ and that π^{Min} and π^{Max} are symmetric around the 2 percent inflation target. Unemployment is on the horizontal axis. U^{ME} represents the unemployment rate consistent with maximum employment, recognizing that we are using "unemployment" as a euphemism for a variety of labor market indicators rather than as a specific unemployment rate.

Conditional on being in a period where inflation has been running persistently below 2 percent, the statement divides the policy space into four zones. The area defined by $U < U^{\text{ME}}$ and $\pi < 2$ is the "Inflation Shortfall Zone" where the FOMC will no longer raise rates based on expectations of higher inflation. The area where $2 < \pi < \pi^{\text{Max}}$ defines the "Flexible Average Inflation Targeting Zone" where inflation is moderately above 2 percent. The area where $\pi > \pi^{\text{Max}}$ is the "Taylor Principle Zone" where the federal funds rate will have to be increased by more than point-for-point with increases in inflation in order to bring inflation down to the 2 percent target.

The area in the policy space where $U > U^{\text{ME}}$ and $\pi < 2$ is the "Employment and Inflation Shortfall Zone" where the FOMC intends to mitigate shortfalls in both employment and inflation. Neither the statement nor the speeches by Powell (2020) and Clarida (2020) specify how the FOMC would guide the economy from the current levels of very low inflation and very high unemployment to their maximum employment and average inflation goals. Policy rule forward guidance shows how employment and inflation shortfalls can be mitigated while accommodation is reduced as the economy moves closer to the FOMC's goals. Enhanced forward guidance, in

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[9] See Clarida (2020).

contrast, specifies that the exit from the ELB will not occur until the economy moves from the Employment and Inflation Shortfall Zone to the area of the Flexible Average Inflation Targeting zone consistent with maximum employment.

3. Monetary Policy Rules Consistent with the Revised Statement

Monetary policy rules have been the subject of an enormous amount of research. They have been discussed by the FOMC since 1995 and federal funds rate prescriptions from the Taylor and balanced approach rules have been presented to the FOMC since 2004. Prescriptions from a variety of rules have been included in the Fed's Monetary Policy Reports since 2017. We first show how to modify the Taylor and balanced approach rules to be in accord with the revised statement and then discuss how the modified rules would affect the prescriptions in the February 2020 Monetary Policy Report.

The Taylor and balanced approach rules in the monetary policy reports are as follows,

$$R_t = r_t^{LR} + \pi_t + \alpha(\pi_t - \pi^{LR}) + \beta(U_t^{LR} - U_t), \tag{1}$$

where R_t is the target level of the short-term federal funds interest rate, π_t is the inflation rate, π^{LR} is the 2 percent target level of inflation, U_t^{LR} is the rate of unemployment in the longer run, U_t is the current unemployment rate, and r_t^{LR} is the neutral real interest rate that is consistent with inflation equal to the target level of inflation and unemployment equal to the rate of unemployment in the longer run.

The Taylor rule has $\alpha = 0.5$ and $\beta = 1.0$. While the rule in Taylor (1993) is written in terms of the output gap with a coefficient of 0.5 and a fixed neutral real interest rate, we follow the Monetary Policy Report and use the unemployment gap and a time-varying neutral real interest rate. The coefficient of 1.0 on the unemployment gap is equivalent to a coefficient of 0.5 on the output gap with an Okun's Law coefficient of 2.0.

Taylor (1999) and Yellen (2012) analyzed an alternative to the Taylor rule that is called the balanced approach rule in the Monetary Policy Report, where $\alpha = 0.5$ but the coefficient β on the unemployment gap in the Taylor rule is raised to 2.0. The balanced approach rule received considerable attention following the Great Recession because, with the then-conventional neutral real interest rate of two percent, it prescribed a negative FFR and thus provided a justification for quantitative easing and a longer period before exiting the effective lower bound.

The policy rules described above contain several elements that are consistent with the revised statement. First, the neutral real interest rate and unemployment rate in the longer run are

time-varying, reflecting the decrease in the past 30 years discussed by Powell (2019). Second, the inflation target remains fixed at 2 percent. Third, the rules include realized, rather than forecasted, inflation as discussed by Powell (2018).

Several elements of the rules, however, need to be modified in order to be in accord with the statement. First, we replace the 2 percent target level of inflation with two values, $\pi^{\text{Min}} < 2 < \pi^{\text{Max}}$, with π^{Min} and π^{Max} symmetric around 2 percent. According to the statement, monetary policy will attempt to overshoot the 2 percent target when inflation has been persistently below 2 percent. By itself, that would produce average inflation of above 2 percent, which contradicts the FOMC's desire to mitigate deviations of inflation around 2 percent. In order to reconcile these objectives, we have added that monetary policy will attempt to undershoot the 2 percent target by the same amount when inflation has been persistently above 2 percent. This is not the same as the FOMC replacing the 2 percent target with a range around 2 percent, which would be inconsistent with the FOMC's desire to overshoot the 2 percent target when inflation has been persistently below 2 percent. Second, we replace the rate of unemployment in the longer run U_t^{LR} with U_t^{ME}, the unemployment rate consistent with maximum employment, and base FFR prescriptions on shortfalls from U_t^{ME} instead of deviations from U_t^{LR}.

We modify the two policy rules to be consistent with the revised statement,

$$R_t = r_t^{LR} + \pi_t + \alpha(\pi_t - \pi^{MAX}, \pi_t - \pi^{MIN}) + \beta(U_t^{ME} - U_t, 0), \qquad (2)$$

where the coefficients α and β define the Taylor and balanced approach rules. The inflation gap is negative and equals $\pi_t - \pi^{MAX}$ during and following periods when inflation has been running persistently below 2 percent. It is positive and equals $\pi_t - \pi^{MIN}$ during and following periods when inflation has been running persistently above 2 percent.[10] The unemployment gap is negative and equals $U_t^{ME} - U_t$ if $U_t > U_t^{ME}$ and is 0 if $U_t < U_t^{ME}$. These rules are in accord with the revised statement because the FFR responds to unemployment shortfalls and inflation is allowed to run above 2 percent before the FFR is raised.

Policy rules were incorporated in the Monetary Policy Reports from July 2017 to February 2020 but were left out of the June 2020 Report. It would make no sense for the Fed to include the old rules in future reports because they are not consistent with the revised statement.

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[10] If inflation is neither persistently above nor persistently below 2 percent, presumably the Fed would return to the 2 percent inflation target.

The modified versions of the Taylor and balanced approach rules in Equation (2), however, could easily be included in future reports.[11]

We illustrate this by contrasting the prescriptions from the Taylor and balanced approach rules in the February 2020 Report with what the prescriptions would have been with the modified versions of the rules. Panel A of Figure 2 depicts the actual FFR as well as the prescriptions from the two rules in Equation (1), using the data in the Report.[12] The exit from the effective lower bound is 2011:Q3 with the Taylor rule and 2014:Q2 with the balanced approach rule, both earlier than the actual exit of 2016:Q1.[13]

Panel B of Figure 2 shows what the figure in the Monetary Report would have looked like with the modified rules. This requires choosing values for π^{MAX}, the inflation rate moderately above 2 percent, and U_t^{ME}, the rate of unemployment consistent with maximum employment. We set $\pi^{MAX} = 2.4$ percent in accord with "moderately" above 2 percent being between 2.25 and 2.5 percent. We set $U_t^{ME} = U_t^{LR} - 0.5$ percent in accord with the FOMC's willingness to be more aggressive about reducing unemployment below its longer-run value until it sees inflation rising. The exit from the effective lower bound is 2013:Q3 with the modified Taylor rule, two years later than with the Taylor rule, and 2015:Q3 with the modified balanced approach rule, five quarters later than with the balanced approach rule. While both modified rules narrow the gap between the prescribed and actual exits, the 2015:Q3 exit with the balanced approach rule is very close to the 2016:Q1 actual exit.

Between 2017:Q1 and 2019:Q3, the unemployment rate was consistently below the longer-run unemployment rate. Panel A of Figure 2 depicts how, because the coefficient on the unemployment gap is larger for the balanced approach rule than for the Taylor rule, the FFR prescriptions in the February 2020 Report from the balanced approach rule are higher than those from the Taylor rule. In contrast, the unemployment rate does not fall below U_t^{ME} until 2018:Q2.

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[11] The Monetary Policy Reports include three additional rules. The adjusted Taylor and price level rules are examples of mechanical make-up rules and the first-difference rule does not include a measure of maximum employment. We do not consider these rules because they are not consistent with the revised statement.

[12] See Federal Reserve Board (2020), Monetary Policy Report, February, Part 2: Monetary Policy, Figures 1 and 2. The federal funds rate is the quarterly average of the midpoint of the target range, the neutral real federal funds rate in the longer run r_t^{LR} and the rate of unemployment expected in the longer run U_t^{LR} are from Blue Chip Economic Indicators, π_t is core PCE inflation, and U_t is the current unemployment rate.

[13] We start the data for the figure at 2011:Q1 in order to focus on the exit dates and end at 2019:Q3 to correspond with the data in the February 2020 Report. While the FFR was raised above the ELB in December 2015, the exit date is 2016:Q1 because the Report uses the quarterly average.

Panel B of Figure 2 shows how the FFR prescriptions from the "modified" February 2020 Report are lower for the modified balanced approach rule than for the modified Taylor rule between 2017:Q1 and 2018:Q1. Starting in 2018:Q2, the prescriptions from the two rules are identical because policy is responding to shortfalls rather than deviations from U_t^{ME} and the differences between the coefficients do not affect the prescribed FFR. In 2019:Q3, the prescribed FFR is higher than the actual FFR with both original rules, but lower than the actual FFR with both modified rules. The rate decreases in September and October of 2019 are, therefore, consistent with the modified, but not the original, rules, reflecting the statement in Powell (2020) that, "To an extent, these revisions reflect the way we have been conducting policy in recent years."[14]

We can decompose the effects on the prescribed FFR into those caused by flexible average inflation targeting and those caused by responding to shortfalls from the unemployment rate associated with maximum employment instead of deviations around longer-run unemployment. First, since the coefficient α is 0.5 for both rules, replacing the 2 percent inflation target with $\pi^{MAX} = 2.4$ percent decreases the prescribed FFR by 0.2 percent because inflation is less than 2 percent for almost all periods.[15] Second, unemployment is higher than U_t^{ME} between 2011:Q1 and 2018:Q1. Since $U_t^{ME} = U_t^{LR} - 0.5$, this lowers the FFR prescription by 0.5 percent for the modified Taylor rule and 1 percent for the modified balanced approach rule because the coefficient β is 1.0 for the Taylor rule and 2.0 for the balanced approach rule. Between 2018:Q2 and 2019:Q3, unemployment is lower than and close to U_t^{ME}, slightly increasing the gap between the original and the modified rules. Overall, the largest difference between the prescriptions from the original and modified rules comes from responding to shortfalls from U_t^{ME} instead of deviations from U_t^{LR}, followed by adopting flexible average inflation targeting.

4.   **Monetary Policy Rules Consistent with the September 2020 SEP Projections**

The first step towards specifying policy rules that are consistent with the September 2020 SEP projections is to choose values for r_t^{LR}, the neutral real interest rate, π^{MAX}, the inflation rate "moderately" above 2 percent that the FOMC is willing to tolerate before starting to attempt to

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[14] Lael Brainard and Janet Yellen discuss how the path of FFR increases from 2015 to 2018 might have been extended under the revised statement. See Brookings Institution (2020).
[15] The only periods where inflation exceeds 2 percent are 2012:Q1, 2018:Q2, and 2018:Q3, where inflation is 2.1 percent and the decrease is 0.15 percent.

lower inflation, and U_t^{ME}, the unemployment rate consistent with maximum employment.[16] We set the neutral real interest rate equal to 0.5 percent from the September 2020 SEP, where the median federal funds rate in the longer run is 2.5 percent and median inflation in the longer run is 2 percent.[17] We set the unemployment rate consistent with maximum employment equal to 3.0 percent because the FOMC is clearly willing to lower unemployment below its 3.5 percent value at the end of 2019 and wait to see if inflation rises before raising rates.

We set the value of π^{MAX} in order to be consistent with the September 2020 SEP inflation projections and flexible average inflation targeting. The SEP inflation projections in Table 1 are 1.5 percent in 2020, 1.7 percent in 2021, 1.8 percent in 2022, and 2.0 percent in 2023, for a cumulative shortfall below the 2 percent target of 1.0 percent. If we project that inflation will thereafter increase by 0.1 percent each year, it will reach 2.4 percent in 2027 with a cumulative excess above the 2 percent target of 1.0 percent. Since the cumulative excess after 2023 equals the cumulative shortfall before 2023, we set π^{MAX} equal to 2.4 percent, which is in accord with the revised statement's goal of moderately above 2 percent.

While the two modified policy rules are consistent with the revised statement, they are not necessarily consistent with the median federal funds rate projections at the end of 2023 from the September 2020 SEP of 2 percent inflation, 4 percent unemployment, and the FFR at the effective lower bound. In order to see which of the rules are candidates for policy rule forward guidance, we substitute $r_t^{LR} = 0.5$, $\pi_t = 2.0$, $\pi^{MAX} = 2.4$, $U^{ME} = 3.0$, and $U_t = 4.0$ into Equation (2),

$$R_t = 0.5 + 2.0 + \alpha(2.0 - 2.4) + \beta(3.0 - 4.0). \tag{3}$$

For the Taylor rule with $\alpha = 0.5$ and $\beta = 1.0$, the prescribed federal funds rate $R_t = 1.3$ percent. For the balanced approach rule with $\alpha = 0.5$ and $\beta = 2.0$, $R_t = 0.3$ percent. We therefore restrict attention to the balanced approach rule since the Taylor rule prescriptions are not in accord with the SEP projection that the FFR will be at the ELB at the end of 2023. In addition, as shown above, the modified balanced approach rule is more consistent than the modified Taylor rule with the December 2015 exit from the effective lower bound.

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[16] We do not need to choose π^{MIN} because we assume that π^{Max} and π^{MIN} are symmetric above and below 2 percent.
[17] A lower (higher) neutral real rate would lower (raise) the prescribed FFR point-for-point, causing a longer (shorter) exit from the ELB and a lower (higher) neutral nominal rate.

5. Policy Rule Forward Guidance for 2020 – 2027

We have shown how to modify policy rules in accord with the FOMC's revised statement and demonstrated that the balanced approach rule is consistent with the median inflation and unemployment projections. We now construct scenarios for how policy rule forward guidance could work in practice. We focus on the dates (1) when the prescribed FFR first rises above 0.25 percent and (2) when inflation equals π^{Max} and unemployment equals U^{ME}.[18]

The criteria for the exit from the effective lower bound with enhanced forward guidance is "until labor market conditions have reached levels consistent with the Committee's assessment of maximum employment and inflation has risen to 2 percent and is on track to moderately exceed 2 percent for some time." For policy rule forward guidance, this could be replaced with language such as "until the prescribed federal funds rate from the policy rule has risen to 0.25 percent and is on track to exceed 0.25 percent for some time." This would allow the FOMC to keep the FFR at the ELB until it was sure that it did not want to reverse course.

The "Policy Rule Exit Curve", the locus of inflation and unemployment pairs for which the prescribed FFR equals 0.25 percent, is depicted in Figure 3 for the balanced approach rule. The area below and to the right of the curve depicts where the federal funds rate is constrained by the ELB while the area above and to the left of the curve represents exits from the ELB. The curve shows combinations of inflation and unemployment that solve Equation (3) for the balanced approach rule with $r_t^{LR} = 0.5$ percent, $U^{ME} = 3.0$ percent, and $\pi^{MAX} = 2.4$ percent.

$$0.25 = 0.5 + \pi_t + 0.5\,(\pi_t - 2.4) + 2.0\,(3.0 - U_t), \tag{4}$$

The FOMC inflation and unemployment projections from 2020 to 2023 and our projections from 2024 to 2027 are reported in Tables 1 - 3. The SEP reports median projections, the full range of projections, and the central tendency which excludes the three highest and lowest projections. We use the median projections for an "average" recovery in Table 1, the values from the central tendency with the fastest increase in inflation and decrease in unemployment for a "fast" recovery in Table 2, and the values from the central tendency with the slowest increase in inflation and decrease in unemployment for a "slow" recovery in Table 3. We then assume that inflation increases and unemployment decreases at a decreasing rate for the three recoveries.

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[18] Bordo, Levin, and Levy (2020) analyze how the Federal Reserve could incorporate scenario analysis into its policy strategy and communications.

The scenario for an average recovery using the median projections in Table 1 is depicted in Figure 3. The "Projections Curve", the combination of inflation and unemployment projections from 2020 to 2027, intersects the policy rule exit curve at about the end of 2023. Following the exit from the ELB in 2024:Q1, inflation rises and unemployment falls until $\pi^{\text{Max}} = 2.4$ percent and $U^{ME} = 3.0$ percent are reached at the end of 2027.[19] After exiting the ELB, the prescribed FFR increases by four ¼ point increments in 2024 and two ¼ point increments in 2025, 2026, and 2027 (assuming the FOMC continues its practice of raising the FFR in ¼ point increments in normal times). The value of 2.9 percent at the end of 2027 is higher than the long-run neutral nominal interest rate of 2.5 percent, calculated as the 2 percent inflation target plus the 0.5 percent neutral real interest rate, because the inflation rate of 2.4 percent is above the 2 percent target.

There is a sharp difference between FFR prescriptions from policy rule forward guidance and enhanced forward guidance that is based on the distinction between accommodative policy and keeping rates at the ELB. Policy rule forward guidance removes accommodation until π^{Max} and U^{ME} are attained. According to enhanced forward guidance, the FFR will not be raised above the ELB until maximum employment and inflation of 2 percent that is on track to moderately exceed 2 percent for some time have been achieved. While inflation is projected to rise above 2 percent starting in 2024, maximum employment is not projected to be attained until the end of 2027. At that point, there would be a very large gap between the ELB of between 0 and 0.25 percent and the FFR prescribed by the policy rule of 2.9 percent.

The scenario for a fast recovery using the central tendency projections in Table 2 is depicted in Figure 4. While the policy rule exit curve is the same as with the average recovery, the inflation and unemployment projections and the FFR prescriptions are different. For the fast recovery, the SEP inflation projection for 2023 and, therefore, our subsequent projections are the same as for the average recovery. Unemployment, however, is projected to decrease more quickly than with the average recovery, reaching 3.0 percent in 2025 and below 3.0 percent thereafter. Consequently, the prescribed FFR increases more quickly than with the average recovery, exiting the effective lower bound in 2023:Q1 and exceeding the long-run neutral nominal interest rate of 2.5 percent in 2025:Q4. At the end of 2027, however, the prescribed FFR is the same as with the

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[19] While the prescribed value of the FFR is slightly above the ELB at the end of 2023, we assume that the FOMC would wait one quarter before exiting to ensure that the FFR was on track to exceed 0.25 percent for some time.

average recovery because projected inflation is the same and the FFR is not increased further when unemployment falls below 3.0 percent.

The scenario for a slow recovery using he central tendency projections in Table 3 is depicted in Figure 5. The SEP projections for the end of 2023 are 1.9 percent for inflation and 4.4 percent for unemployment, in contrast with 2.0 percent for inflation and 4.0 percent for unemployment for the average recovery. Consequently, the prescribed FFR increases more slowly than with the average recovery, exiting the effective lower bound in 2025:Q1 and, at 1.95 percent, is considerably below the long-run neutral nominal interest rate of 2.5 percent at the end of 2027. Both the fast and slow recoveries illustrate the difference between policy rule forward guidance and enhanced forward guidance, for which the FFR would be at the ELB at the end of 2025 for the for the fast recovery and the end of 2027 for the slow recovery.

6.   Conclusions

The combination of the revised statement on Longer-Run Goals and Monetary Policy Strategy, the median projections by the members of the Federal Open Market Committee for the federal funds rate through the end of 2023, and enhanced forward guidance represent a major change in the conduct of monetary policy. We show how to construct policy rules that are consistent with the revised statement by modifying the Taylor and balanced approach rules. While these rules are somewhat more complicated than the original rules, the revised statement is still compatible with rules-based policymaking. We illustrate what the February 2020 Monetary Policy Report would have looked like with the modified rules and how they lengthen the prescribed exit from the effective lower bound following the Great Recession.

We show how these rules can be used to provide policy rule forward guidance following the Covid-19 recession. We focus on the balanced approach rule for consistency with the median projections from the September 2020 Summary of Economic Projections. Both enhanced forward guidance and policy rule forward guidance are outcome-based and are consistent with the revised statement and the median federal funds rate projections for the end of 2023. The major difference is that policy rule forward guidance raises the federal funds rate and removes accommodation as the economy improves while enhanced forward guidance keeps the federal funds rate at the effective lower bound for much longer. We believe that policy rule forward guidance is both more desirable and more credible than enhanced forward guidance and show how it could work in practice through scenarios with average, fast, and slow recoveries.

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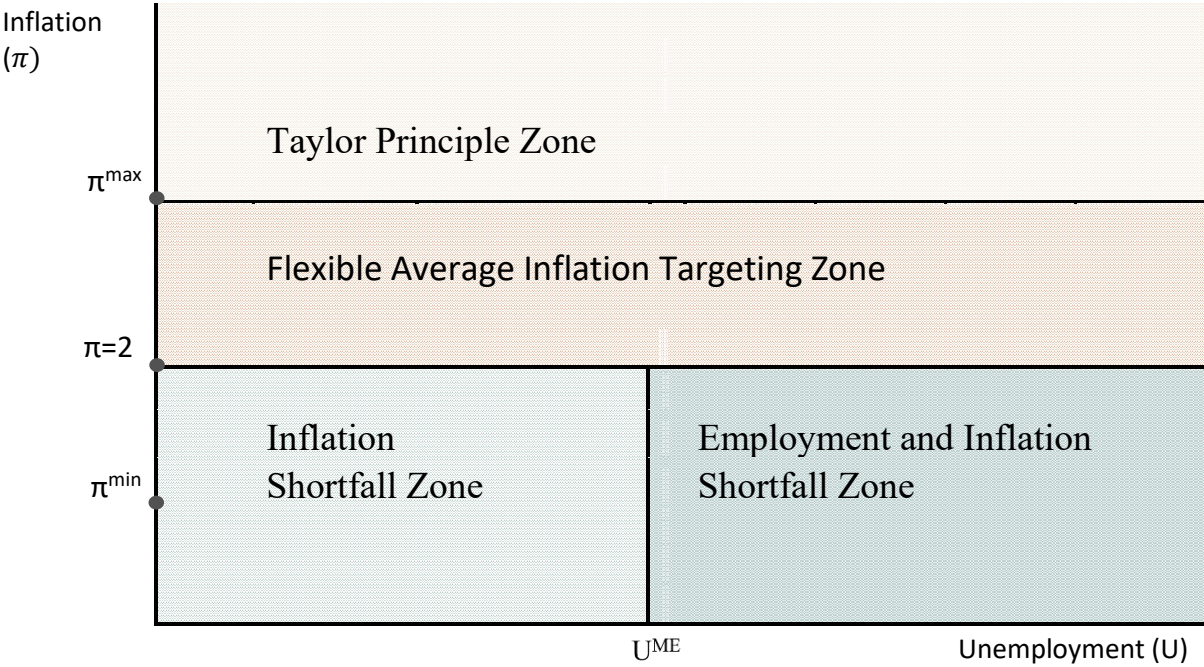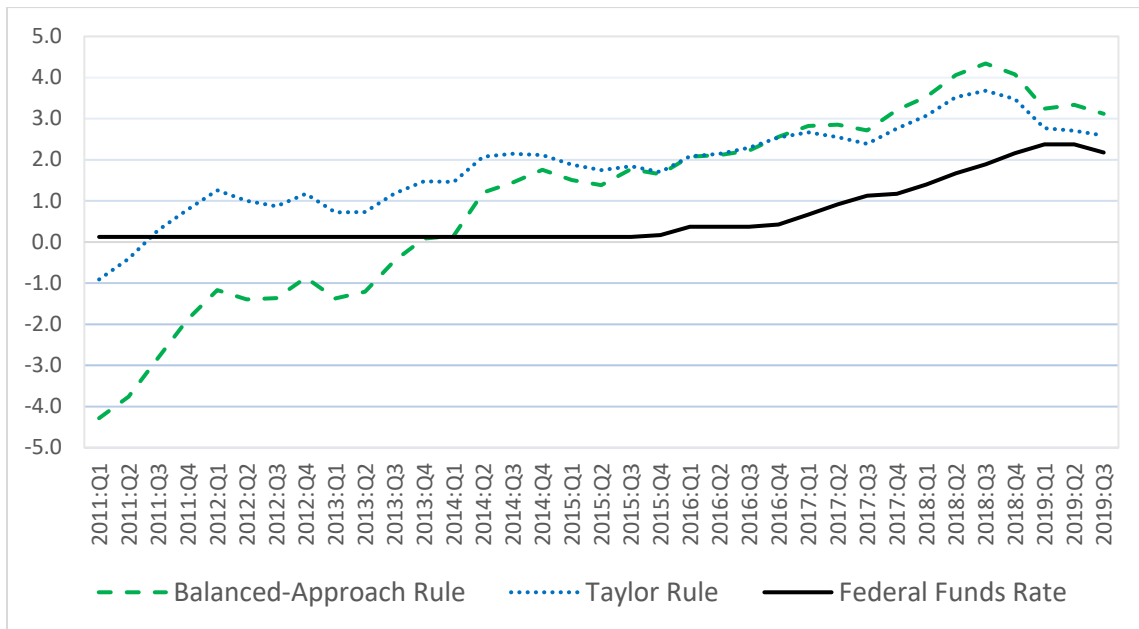**Figure 1. Revised Statement on Longer-Run Goals and Monetary Policy Strategy**

Inflation
(π)

Taylor Principle Zone

π^{max}

Flexible Average Inflation Targeting Zone

$\pi=2$

Inflation
Shortfall Zone

Employment and Inflation
Shortfall Zone

π^{min}

U^{ME} Unemployment (U)

Figure 2.

Panel A. Historical Federal Funds Rate Prescriptions from Policy Rules

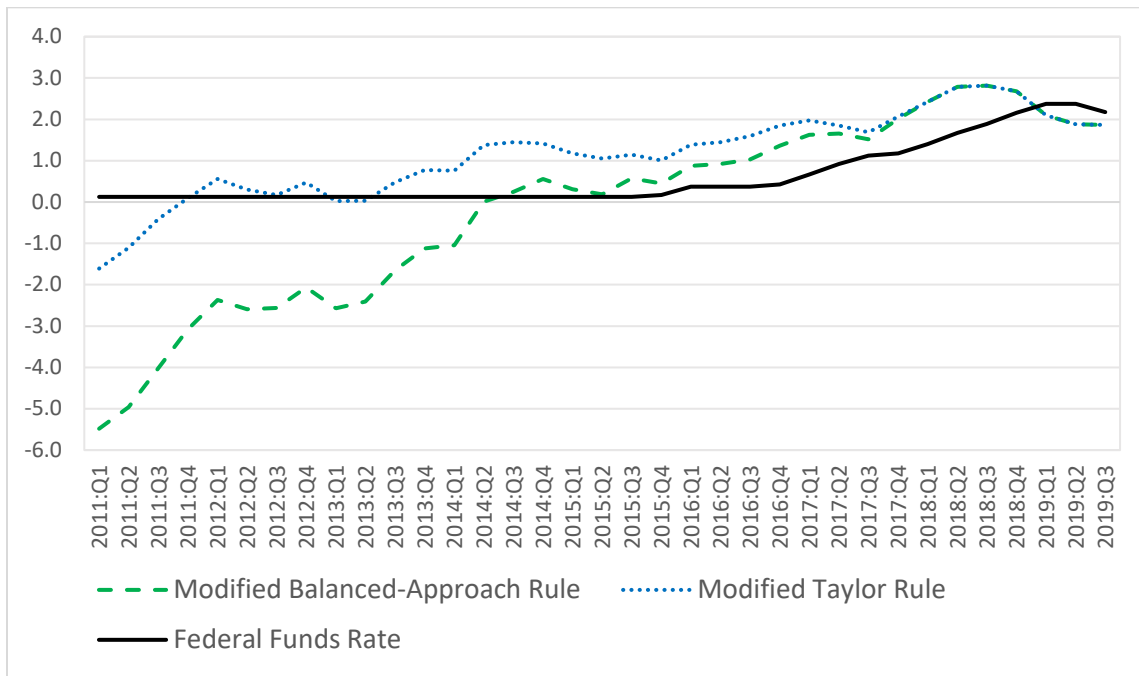**Panel B: Federal Funds Rate Prescriptions from Modified Policy Rules**

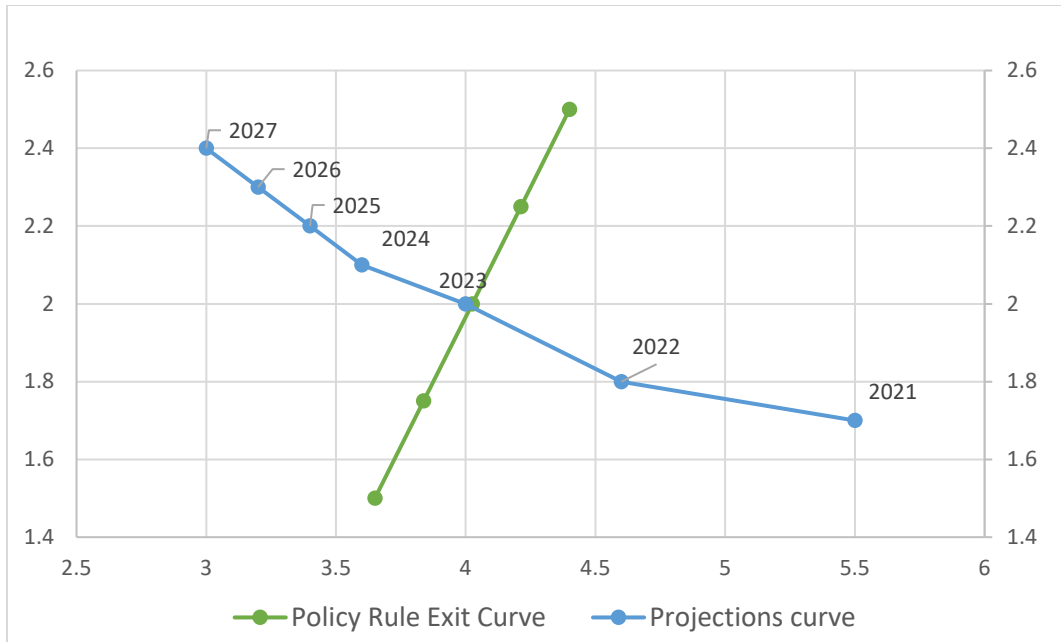**Figure 3. Average Recovery: Projections Curve and Policy Rule Exit Curve**

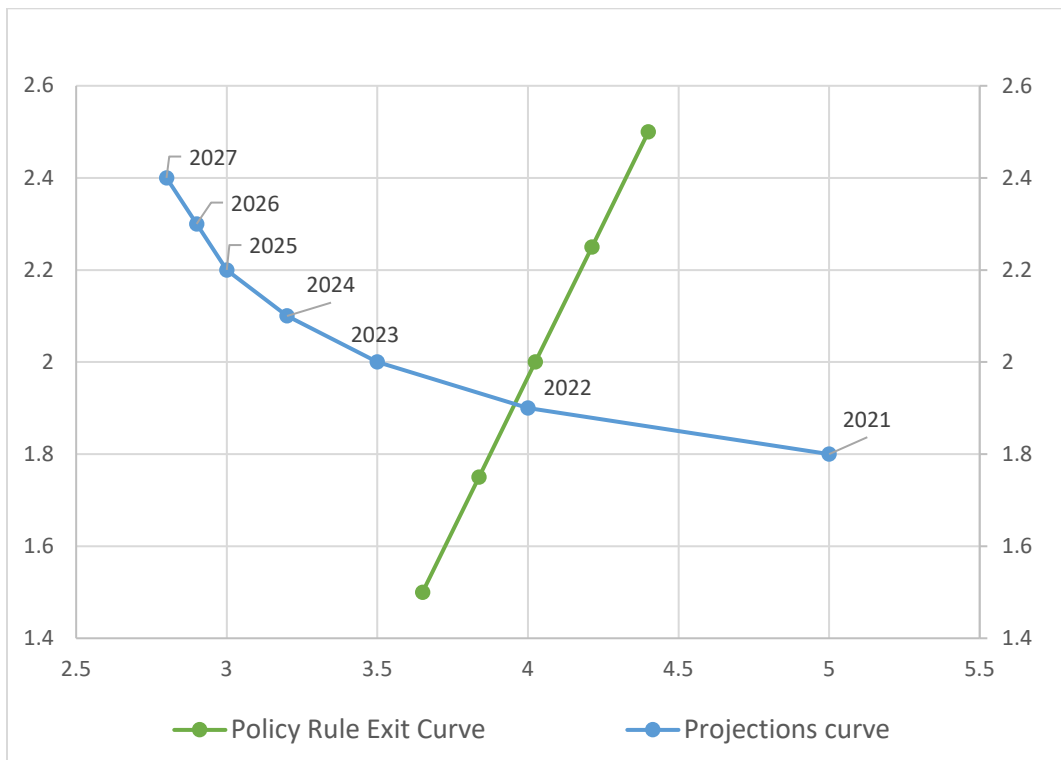**Figure 4. Fast Recovery: Projections Curve and Policy Rule Exit Curve**

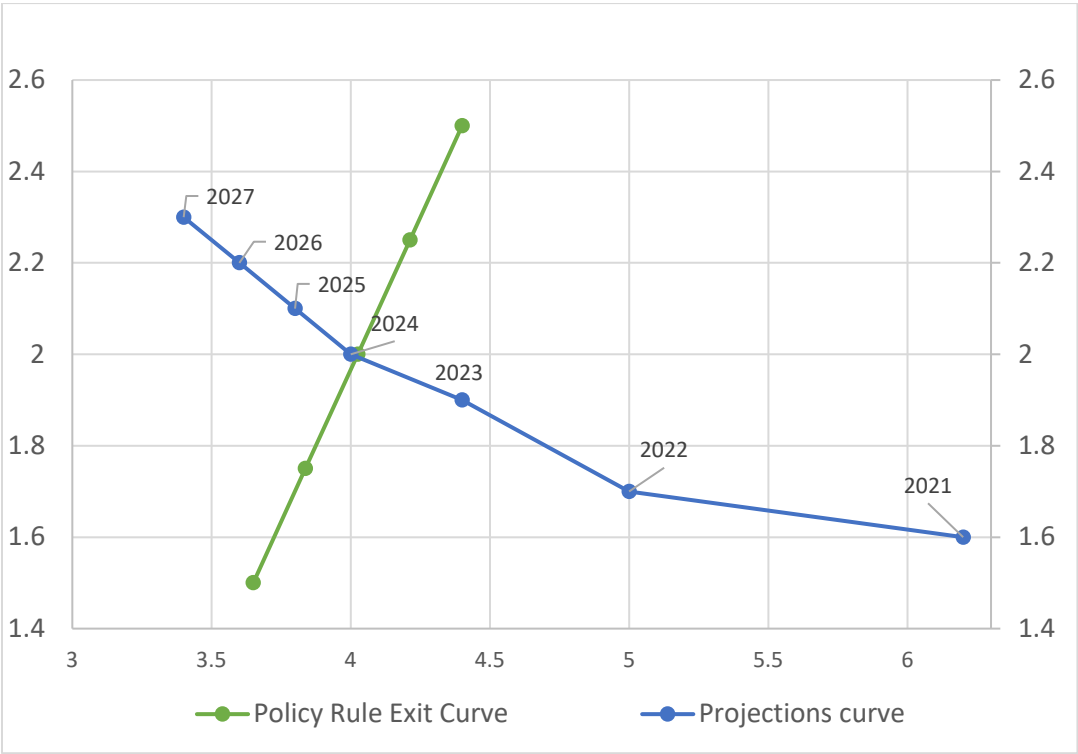**Figure 5. Slow Recovery: Projections Curve and Policy Rule Exit Curve**

Table 1. Average Recovery

Average Recovery Projections			
Year	Unemployment	Inflation	Prescribed FFR
2020	7.6	1.5	-7.65
2021	5.5	1.7	-3.15
2022	4.6	1.8	-1.20
2023	4.0	2.0	0.30
2024	3.6	2.1	1.25
2025	3.4	2.2	1.80
2026	3.2	2.3	2.35
2027	3.0	2.4	2.90

Note: The table includes the FOMC inflation and unemployment projections from 2020 to 2023 and our projections from 2024 to 2027. We use the median projections for an "average" recovery. We then assume that inflation increases and unemployment decreases at a decreasing rate. The prescribed FFR is computed using the balanced approach rule.

Table 2. Fast Recovery

Fast Recovery Projections			
Year	Unemployment	Inflation	Prescribed FFR
2020	7.0	1.5	-6.45
2021	5.0	1.8	-2.00
2022	4.0	1.9	0.15
2023	3.5	2.0	1.30
2024	3.2	2.1	2.05
2025	3.0	2.2	2.60
2026	2.9	2.3	2.75
2027	2.8	2.4	2.90

Note: The table includes the FOMC inflation and unemployment projections from 2020 to 2023 and our projections from 2024 to 2027. We use the values from the central tendency with the fastest increase in inflation and decrease in unemployment for a "fast" recovery. We then assume that inflation increases and unemployment decreases at a decreasing rate. The prescribed FFR is computed using the balanced approach rule.

Table 3. Slow Recovery

Slow Recovery Projections			
Year	Unemployment	Inflation	Prescribed FFR
2020	8.0	1.3	-8.75
2021	6.2	1.6	-4.70
2022	5.0	1.7	-2.15
2023	4.4	1.9	-0.65
2024	4.0	2.0	0.30
2025	3.8	2.1	0.85
2026	3.6	2.2	1.40
2027	3.4	2.3	1.95

Note: The table includes the FOMC inflation and unemployment projections from 2020 to 2023 and our projections from 2024 to 2027. We use the values from the central tendency with the slowest increase in inflation and decrease in unemployment for a "slow" recovery. We then assume that inflation increases and unemployment decreases at a decreasing rate. The prescribed FFR is computed using the balanced approach rule.