The Fed’s Monetary Policy Framework in the wake of COVID-19
New Framework Elements, and ad hoc Fiscal-Monetary Coordination

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In the fall of 2018, the Fed embarked on a process to conduct a systematic review of its monetary policy framework (MPF). Initiated by Chair Powell and headed up by Vice-Chair Clarida, the process was meant to evaluate the current MPF—the tools, strategies and communications by which the Fed aims to achieve its Congressionally-mandated goals—and consider whether any systematic changes might be beneficial.¹

The review was prompted by the joint challenges of
- Low equilibrium interest rates, which imply more frequent trips to the effective lower bound;
- Inflation that has been chronically below the Fed’s two percent objective;
- A slip in long-run inflation expectations, likely related to the prolonged history of below-2% inflation;
- A very low response of inflation to economic activity (a “flat Phillips curve”) that in turn implies a low response of inflation to monetary policy actions; and
- A concern that these environmental challenges jointly put both inflation and unemployment goals at risk going forward.

The central question of the review was whether alternative policies such as “make-up” policies—loosely, policies that try to achieve an inflation rate that averages two percent, rather than just attain two percent without regard to inflation’s history above or below two—could help the Fed to effectively stabilize the economy, keeping it closer to full employment, and centering inflation more consistently on the 2% objective. We will discuss the theoretical and practical appeal of such policies in more detail below.

The advent of the novel Coronavirus, the public health restrictions that have been required to slow its spread, and the consequent sharp and rapid decline in economic activity make some of the earlier questions about how to adapt the Fed’s monetary policy framework seem a bit quaint. Even so, the current crisis brings the concerns raised in the Framework Review into even sharper relief. As the crisis began to unfold in late February, the Federal Reserve’s target for its main policy rate (the federal funds rate) had been set in a range between 1.5 and 1.75%, leaving relatively little room to lower that rate should additional stimulus be required.² By the first week of March, it had lowered the funds rate one-half percentage point, and within ten days, it had lowered the rate to its effective lower bound, a range of zero to one-quarter percentage point.

At the same time, it pledged to purchase at least $500B of Treasury securities and at least $200B of (government-guaranteed) mortgage-backed securities. These purchases—often called “quantitative easing” or “balance sheet policy”—are meant both to stabilize these important markets

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¹ In the interest of full disclosure, I was a member of the staff steering committee that guided the staff work that supported the MPF review until February of 2020.
² Recall that on average during post-war recessions, the Fed has lowered the funds rate by an average of approximately 5 percentage points.
(or to “support the smooth functioning of markets”)\(^3\), and to keep long-term rates lower than they would otherwise be. While the Fed has virtually unlimited capacity to purchase privately-held securities, the effects of such purchases on long-term rates are constrained by the (presumed) effective lower bound on such rates. Long-term interest rates had already declined to historically low levels prior to the Fed’s actions. Thus this alternative policy tool, like the conventional federal funds rate tool, has limited “policy space”—limited room to reduce rates, and thus limited potency to provide macroeconomic stimulus. Simply put, both short-term and long-term interest rates were already low prior to the crisis, so the Fed’s ability to provide stimulus via either of these channels was limited.

Echoing its response during the Great Recession and financial crisis, the Fed put in place a raft of liquidity provisions to maintain the flow of short-term credit to financial entities and nonfinancial businesses, taking actions to shore up commercial paper markets, money market mutual funds, Treasury securities trading, and municipal bond and commercial paper and bond issuance. It is likely that the Fed will be able to stabilize short-term credit markets within months, as they did in the financial crisis. The addition of municipal securities and corporate bonds to the mix in this round represent two important innovations, discussed in more detail below.

So where do these actions fit into the Monetary Policy Framework Review?\(^2\) The COVID-induced economic crisis has made abundantly clear the risks of running monetary policy in a low-inflation, low-interest rate environment (the primary motivations for the Review), if they were not evident before. In the coming year or two, the Fed will have deployed both liquidity and macro stimulus tools, many untested, to support the economy, in large part because conventional (short-term interest rate) policy had limited space to operate. As the economy recovers from the crisis, inflation will almost surely be once again below the two percent target, and the questions of how to make good on our two percent inflation promise, and how best to structure policy in this era, will remain relevant. Critically, the fiscal-monetary partnership that has been forged on the fly during this nascent crisis will be the subject of debate for some time to come. If inflation and interest rates remain low, as I suspect they will, responding to run-of-the-mill economic downturns will increasingly be a matter of fiscal and monetary partnership, as the central bank and the federal government will share in (temporarily) bearing risk on behalf of the private economy.

On August 27, 2020, the Fed officially concluded its MPF, as highlighted in the Chair’s speech at the (remote) Jackson Hole conference. The culmination of the process is the new Consensus Statement on Longer-Run Goals and Monetary Policy Strategy—the official document that defines the key elements of its MPF.\(^4\) There are a number of quite important, if seemingly subtle changes in the new statement. While these will be discussed in more detail below, two key changes are

\(^3\) In announcing a new round of long-term asset purchases, the March 15\(^{th}\), 2020 FOMC statement uses this language: “To support the smooth functioning of markets for Treasury securities and agency mortgage-backed securities that are central to the flow of credit to households and businesses, over coming months the Committee will increase its holdings of Treasury securities by at least $500 billion and its holdings of agency mortgage-backed securities by at least $200 billion.” It used essentially the same language in its April 29, 2020 statement: “…the Federal Reserve will continue to purchase Treasury securities and agency residential and commercial mortgage-backed securities in the amounts needed to support smooth market functioning, thereby fostering effective transmission of monetary policy to broader financial conditions.”

\(^4\) The new consensus statement may be found here https://www.federalreserve.gov/monetarypolicy/review-of-monetary-policy-strategy-tools-and-communications-statement-on-longer-run-goals-monetary-policy-strategy.htm. This link provides a very helpful guide to the changes made to the statement, which are discussed below:
1. “In order to anchor longer-term inflation expectations at this level, the Committee seeks to achieve inflation that averages 2 percent over time, and therefore judges that, 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.” The definition of the inflation goal was modified so that the Committee now seeks inflation that averages 2 percent over time. The rationale is that attaining a 2 percent average is more likely to anchor longer-term inflation expectations at 2 percent. Anchoring long-run expectations is seen as critical, as long-run expectations are believed in turn to anchor the realized inflation rate. Notably, the Statement calls out periods when inflation is below 2 percent as requiring inflation above 2 percent for some time thereafter. Both the rationale—the link to long-term expectations—and the asymmetry, while subtle, bear important implications for the conduct of policy, which we examine below.

2. “In setting monetary policy, the Committee seeks over time to mitigate shortfalls of employment from the Committee's assessment of its maximum level and deviations of inflation from its longer-run goal.” Again, this part of the Statement emphasizes a key asymmetry: It is shortfalls of employment from its (estimated) maximum sustainable level that will prompt policy actions. Overshooting full employment is not mentioned as a concern. While terse, this change likely reflects input from many constituents during the “Fed Listens” tour that the tight labor market that existed prior to the pandemic provided substantial benefits to the workforce, especially to those who are often marginal participants in the labor force, including low-income workers who are disproportionately people of color. It also likely reflects the long experience in the U.S. economy with very tight labor markets and little or no hint of inflation pressure.

Implicit in these conclusions are a number of assumptions that may benefit from further scrutiny. In particular, the role played by long-run inflation expectations is central to the new MPF Statement. What role such expectations actually play is subject to debate, and will be discussed more below. In addition, the benefits that might be attained by employing an average inflation objective depend in part on how agents in the economy form both shorter- and longer-run expectations, another margin that is subject to debate. I provide some quantitative modeling results below to illustrate the differences in outcomes that can arise under different expectations assumptions. Finally, the observation that the link between economic activity and inflation—the Phillips curve, loosely—has weakened, calls into question the extent to which the Fed can affect employment or inflation. It is interesting that the emphasis on employment shortfalls is likely premised in part on the recent experience in which overshooting of full employment, relative to many estimates including the Fed’s own, has not produced a corresponding overshooting of inflation. This is a restatement of the estimated flatness of the Phillips curve—a benefit if one wishes to aim for very full employment, but a detriment when one wishes to affect the economy through monetary policy actions generally.

Are there specific longer-run recommendations for the monetary policy framework that will come out of this crisis? It’s of course difficult to know, but I would venture a few:

(1) A higher inflation goal, should we be able to achieve it, would provide the Fed more conventional policy space, i.e. more room to lower interest rates in the event of a downturn.

While there are many issues associated with altering the inflation goal (discussed below), such a change might well be worth the investment for its long-run benefits;  

(2) Previous proscriptions against lending to private firms, to state and local governments, and to support the corporate bond market, while unlikely to be the norm, are now of necessity on the table. They were viewed as outside the Fed’s remit in the earlier financial crisis. While they may not be considered tools for run-of-the-mill recessions, they will no longer be completely off the table for more serious economic downturns;  

(3) Such policies inherently involve taking on credit risk, a role the Fed has been reluctant to take, in part because doing so is considered by many to be the province of fiscal policy. However, that delineation is fuzzier now. The fuzziness has manifested itself in a Fed-Treasury partnership that is breaking new ground that probably won’t be unbroken soon. One option is for the Treasury to take on all credit risk associated with such programs, a step they may not have taken to date. Absent such a measure, the Fed is taking on credit risk, at least in theory, to the extent that realized credit losses could exceed Treasury backstops.  

(4) Alternative MPF’s, such as so-called “make-up” policies that promise above-2% inflation following protracted episodes of below-2% inflation, may enhance the Fed’s stabilizing powers when the economy calms down, but their likely impact is limited, so the first three features will likely be more important.

1. **The History of the Framework Review**

As documented in Fuhrer, Olivei, Rosengren and Tootell (FORT, 2019), the Federal Reserve System’s Monetary Policy Framework (MPF) has evolved almost continuously since the inception of the institution. The reasons for the changes have been many and varied, but the accumulated effect of the changes means that one would be hard-pressed to find vestiges of the original framework in today’s incarnation.

Despite the many changes, the Fed had not engaged in a systematic process for reviewing the efficacy of the MPF until 2019-2020. Following up on a Brookings session in January 2018, at the request of Jim Stock, the Boston Fed team (FORT) wrote a paper that outlined the history of the MPF, the rationale for embarking on a systematic review of the MPF, options for the structure of such a review, and some of the complications that were likely to arise in pursuing such an evaluation. That paper concluded that a systematic process for evaluating the MPF would likely improve economic performance over time, although it is unlikely that any improvements would be dramatic. The paper catalogues the numerous examples of MPF change, some forced by failure of the previous regime, some urged by development of economic theory, and some initiated by a strong Chair who saw the need for change. While the MPF has changed quite continuously over many decades, it has only been sporadically that the System has conducted a thorough review of its MPF efficacy, looking backward and forward.

The Fed decided in late 2018 to embark on a systematic review spanning 2019 and the first half of 2020. The review included a System-wide conference in June of 2019 that included both academic

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5 As a rough calibration, each percentage point increase in long-run inflation increases nominal interest rates by about one percentage point. An additional percentage point on the federal funds rate can offset one percentage point of decline in output, and about one-half percentage point on the unemployment rate, or about 800 thousand jobs.
presenters and community representatives; a series of “Fed Listens” convenings that varied in structure but which often focused primarily on obtaining input about the effects of the Fed’s MP actions from a variety of constituents, ranging from community organizers to representatives of specific demographic groups to retiree and small business representatives; and a series of FOMC discussions, supported by staff memoranda covering a variety of MPF topics—an assessment of the economic environment that motivated the review, an evaluation of the use of tools during and in the wake of the Great Recession, analysis of a variety of “make-up” policies, consideration of the commitment and time-inconsistency implications of these policies, consideration of alternative uses of forward guidance and balance sheet policy, assessment of the impact of alternative strategies on heterogeneous labor markets, and a discussion of the interaction between alternative strategies and financial stability considerations, and the use of different types of inflation ranges in defining and implementing the Fed’s inflation goal.

Importantly for the forgoing discussion of fiscal/monetary coordination, the Fed did not publicly engage Congressional representatives or the Administration in discussion of monetary policy framework options. In 2011-2012, when the Fed was debating the adoption of an explicit numerical inflation objective, then-chair Bernanke spent considerable time on the Hill garnering feedback on this possibility. One can imagine that the current chair has been engaged in similar efforts. He has said publicly that it is especially important that Congress be comfortable with any alternative policies that intentionally aim for inflation above (or below) target, as such policies might stretch the accepted definition of “price stability.” In part for this reason, consideration of an alternative inflation goal—say 3 or 4%—was taken off the table early in the framework review process, as it was considered a risk that Congress would reject higher inflation goals as inconsistent with the agreed-upon working definition of price stability.

Apart from the broad historical context and generic arguments in favor of a systematic review, the review was motivated importantly by the likelihood that the underlying equilibrium real rate of interest for the US economy will be low for some time. This in turn implies that, other things equal, the amount by which the Fed can lower interest rates in a downturn is likely to be limited. That in turn strongly suggests that we will be likely to hit the zero lower bound on interest rates with greater frequency, a likelihood that implies that it would be wise to have other tools—or more powerful ways of using our existing tools—to mitigate the effects of recessions on output, employment, inflation and inflation expectations.

Chair Powell has chosen to limit the scope of the Review in a number of ways. As suggested above, the Committee has maintained the definition of “price stability” as a 2% inflation rate as measured by the personal consumption chain-type price index—the numeric value of the inflation objective is off the table, at least for now. That limitation is likely a significant one, as will be discussed in more detail below. Using very rough quantitative guides, a one percentage point increase in the equilibrium nominal policy rate translates into additional capacity to offset a one

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7 It is a matter of public record that the current chair has made more visits to Congressional representatives per year than his predecessor.
percentage point shortfall in real GDP and, correspondingly, a one-half percentage point rise in the unemployment rate, or roughly ¼ million jobs. It is not easy to replicate these advantages with other alternatives, although optimistically, some might get half-way there.  

Second, the inquiry focused on a subset of all available options. These include the consideration of a limited set of so-called “make-up” policies, which I will describe in a moment; expanded use of forward guidance on the policy rate; and expanded use of “balance sheet policy” (BSP). All of these, it is hoped, could help to address the problems that the Fed is very likely to face during downturns that require the Fed to lower the policy rate near zero, albeit in different ways. Some of the more ambitious variants of make-up policies appear to have been set aside by the Committee, as evidenced by commentary in the minutes from the July and September FOMC meetings. I will return to the winnowing of the decision tree by the FOMC after I have defined the options that have been under consideration.

Make-up policies

The key distinction between make-up and the current bygones-be-bygones policies is the notion that the Fed would intentionally deviate from its 2% inflation goal for a period, likely once the economy has re-attained full employment following a downturn or a boom. The promise to deviate would be made with the intent to “make up” for past misses of inflation below/above target with future overshoots/undershoots of inflation relative to target, hence the moniker. The Fed would accomplish inflation overshoots/undershoots by holding interest rates lower/higher for longer than it normally would in such circumstances. Because the motivation from recent history largely stems from a concern about recessions that force the policy rate to the zero lower bound and entail protracted bouts of sub-target inflation, this paper will focus mostly on the case of too-low or undershooting inflation that could be followed by above-target/overshooting inflation following a recession.  

The presumed benefits of a make-up policy would be (a) to spur economic activity during the recession, leading to a speedier recovery of employment and output; (b) to do so in part by keeping nominal interest rates lower than they would otherwise be, and in part by raising expectations of inflation later on, which in turn would help to lower expected real interest rates; (c) in so doing, keep average inflation closer to the 2% goal; and (d) as a consequence, keep inflation expectations better “anchored” at the two percent goal. If expectations remain anchored near the goal, this in turn could help to return inflation to its 2% target, although this depends on a number of assumptions discussed below.

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8 Recent work examines the relationship between changes in the target inflation rate and the equilibrium level of nominal interest rates. A rough approximation suggests the relationship would be one-for-one, but more careful analysis suggests that there could be some slippage, due primarily to …

9 The case in which inflation persistently overshoots the inflation goal may also be of interest. Notably, because the Fed would need to hold rates higher than it otherwise would, it would not be constrained in this case by the effective lower bound. In addition, because its interest rate response to prolonged expansions is similarly unconstrained, the upside of a cyclical fluctuation would not bear the symmetric implications for inflation overshooting that the downside of the cycle bears for inflation undershooting in the presence of the effective lower bound.
There are a number of variants of make-up policies that vary in the horizon over which they would make up for inflation misses, the symmetry of the concern for past inflation misses, the extent to which one uses rule-like behavior to enforce the make-up policy, and the communications around such policies, which can be quite delicate. We will examine several leading cases below. We will also use simple macroeconomic models that explicitly build in the zero lower bound to assess the quantitative benefits from employing such policies. In so doing, we will follow in the path of recent papers by Bianchi et al (2019), Kiley and Roberts (2017), Mertens and Williams (2019), Nakata (2020), Nessen and Vestin (2005), Reifschneider and Wilcox (2019), and Walsh (2019).

A number of key assumptions are required to hold, at least approximately, to attain the theoretical success of such policies, and all of these assumptions are worthy of scrutiny. A first issue is that of “time inconsistency,” which seems deeply theoretical but, in this instance, is a highly practical and difficult matter. The time inconsistency issue arises because in a make-up policy, if successful, the policymaker will likely find herself at a juncture at which inflation is at target, employment is full, and growth is sustainable. But at that point, if the policymaker were to re-optimize, she might conclude that it would be just fine to leave things as they are. However, at least theoretically, the economy would have arrived at this happy circumstance only because the central bank had promised to overshoot inflation after the attainment of the inflation goal and full employment. Not to follow through on this promise would make it difficult ever again to use such a strategy, as markets and the public would have a difficult time believing that the central bank would this time follow through on its promise. It is in that sense that the policymakers must confront the issue of time inconsistency—what is optimal at the outset could appear sub-optimal at a later time—and policymakers would need to develop mechanisms to commit to the policy in the face of time inconsistency. Indeed, as suggested in this simple description, the ability to commit to such a time-inconsistent policy is critical to its success. But implementing such a commitment is non-trivial—a current Committee would be committing a future Committee, perhaps with a different Chair and likely with some different members, to pursue a time-inconsistent policy that might be difficult to explain to the public at the pivotal moment.

A second assumption that is critical to the success of make-up policies is how expectations are formed. In theoretical rational expectations (RE) models, everyone knows and believes the Fed’s commitment to overshoot its inflation goal, and the attendant benefits that come from lower expected real rates can be garnered. However, there is a host of research on how expectations are actually formed that suggests that RE may not be the best approximation to reality in all circumstances, perhaps most importantly during recessions and crises. Thus this paper will assess the sensitivity of model predictions about the benefits of make-up and related policies to alternative expectations assumptions, drawing on existing research and presenting additional findings.\footnote{As we will demonstrate below, it is not essential that all agents exhibit purely rational expectations to achieve some of the benefits of make-up policies. However, expectations that respond sluggishly enough to information can change the predicted outcomes under make-up policies quite significantly.}

A third issue is the role that short-term and long-term inflation expectations play in the determination of inflation. In this regard, a number of central banks have adopted the notion that only long-run expectations directly influence inflation. Keeping such expectations “anchored” on
the central bank’s inflation goal thus becomes paramount in attaining the inflation objective. While there is significant intuitive appeal to this notion—a successful central bank should expect expectations at some horizon to center on its announced inflation goal—the precise role that measured long-run expectations play in determining real-world inflation remains an open question.

All of these underlying assumptions will be examined, empirically and theoretically, in the sections below.

**Balance Sheet policy and Forward Guidance**

The Fed undertook a few different types of balance sheet policy (BSP) and forward guidance during and in the aftermath of the Great Recession and financial crisis. With respect to BSP, they first announced specific quantities of assets to purchase. Later, they chose to swap short-term for long-term assets, rather than making outright purchases that increased the size of the Fed’s balance sheet. Finally, they pursued a “flow-based” threshold policy that promised to keep buying a specific amount each month until a specific economic threshold was reached.

One policy they did not pursue was to target or cap long-term interest rates—sometimes called “yield curve control” (YCC). Because other actors exert considerable influence in long-term bond markets—notably foreign purchasers/sellers and the U.S. Treasury—it is difficult to anticipate the effect of purchasing $X of U.S. Treasury bonds on the corresponding Treasury yield. Using some variant of YCC could thus be more effective in achieving the interest rate levels that are necessary to stimulate the economy. But it would of course do so at the expense of making the quantity of assets purchased endogenous to economic developments (which would affect domestic, foreign and US Treasury demand for and supply of the relevant securities), and thus more uncertain. Depending on the size of the market for the interest rate the central bank chose to cap or target, fluctuations in the balance sheet under such a policy could be quite large. Apart from the difficulties in balancing demand and supply for such assets, long-term interest rates of late have been below one percent, limiting the effect that a rate-capping policy might otherwise have. That is, the policy space is limited for any policy that aims to lower long rates, or to keep them low.

Another tool that has been widely-employed by central banks in recent decades is forward guidance. In response to the Great Recession, the Fed employed several types of forward guidance (FG)—qualitative (“rates will be low for a considerable period”), date-based (“rates will be low for at least two years”), and outcome-based (“rates will be low until a condition is satisfied”). The Fed primarily employed the first two methods, but could explore more outcome-based FG, perhaps to good effect.

The uncertainties around the efficacy of BSP and FG are considerable. With respect to the former, authors inside the Fed generally see the purchase of safe assets as having been effective in improving the constellation of asset prices and spurring activity and inflation. [cites] There is less certainty about this outside the Fed (see for example Hamilton 20xx). With respect to FG, some evidence suggests that date-based FG was reasonably effective, whereas the murkier qualitative FG
was less so [cites]. Of course, FG is inherently tied up in expectations, so the caveats regarding expectations in the context of make-up policies apply here as well.

The inflation goal

The benefits that are hoped to accrue through any of these policies are necessarily counter-factual, and thus can only be simulated via models, making the results model-dependent. However, for most estimated models, the benefits to make-up policies and forward guidance are generally quite modest, especially if one takes into account some of the uncertainty around underlying assumptions noted above. The typical overshoot of inflation that is feasibly produced is on the order of one-half percentage point or less, and the corresponding effects on real rates, the path of the policy rate, and the benefits to unemployment and inflation are correspondingly modest. The effects on inflation, in particular, tend to be small due to the widely-held assessment that the slope of the Phillips curve (the responsiveness of inflation to real activity) is currently quite shallow.

The benefits of raising the inflation goal and thus the equilibrium nominal policy rate are likely to be more significant, although feasible increases in the goal would not solve all macroeconomic stabilization problems. The multiplier from increases in the nominal policy rate to output saved in a recession is approximately one-for-one—one gains about one percentage point of output for every additional percentage point by which the Fed can lower the policy rate. The transmission from changes in the inflation goal to the equilibrium nominal policy rate may not be one-for-one, as recent authors have emphasized. But within the relevant range—changes in the inflation goal of at most one or two percentage points—the transmission is likely to be not far from one-for-one.11

Of course, this simple calculus ignores a multitude of difficulties entailed in changing the inflation goal: (a) it may be very difficult to raise inflation by one or two percentage points in a modest amount of time. The flatness of the Phillips Curve suggests it would take many years to get to an inflation rate that rests consistently above two percent. Thus there is some risk of failing to achieve it; (b) Many note that it would be difficult to communicate to Congress and the public how an inflation goal noticeably above two percent comports with our Congressionally-mandated goal of achieving “price stability;” (c) Furthermore, many worry that moving the inflation goal up could un-anchor inflation expectations and lead to an undesirable upward spiral of inflation, well beyond the desired level. Still, because the benefits in terms of stabilizing recessions are first-order, and arguably quite a bit larger than those that might accompany make-up policies or moderate use of BSP or FG, it seems advisable to keep this option on the table.

Summary: The Pruning of the MPF Decision Tree

In the end, as revealed by FOMC minutes, the set of policies under serious consideration by the FOMC was winnowed over the months of the framework evaluation. First, as suggested above, alteration of the numerical inflation objective was ruled out. Second, stricter versions of make-up policies—such as average inflation targeting or price-level targeting—that verged on the use of rules

to guide or determine policy were eschewed, as the majority of the Committee, while seeing the virtues of rules as benchmarks, did not wish to be constrained by any such rule. The following paragraph from the September 2019 minutes is illuminating, as it is fairly explicit about the Committee’s preference with respect to some of the alternative frameworks:

“Although ensuring inflation outcomes averaging 2 percent over time was seen as important, many participants noted that the illustrated makeup strategies delivered only modest benefits in the staff’s model simulations. These modest benefits in part reflected that the responsiveness of inflation to resource slack had diminished, making it more difficult to provide sufficient accommodation to push inflation back to the Committee’s objective in a timely manner. Some participants suggested that the modest effects were particularly pronounced using the FRB/US model and indicated the need for more robustness analysis of simulation results along several dimensions and for further comparison to other alternative strategies. In addition, several participants noted that the implementation of the makeup strategies in the form of either average inflation targeting or price-level targeting in the simulations was tied too rigidly to the details of particular rules. An advantage of the current framework over such alternative approaches is that it has provided the Committee with the flexibility to assess a broad range of factors and information in choosing its policy actions, and these actions can vary depending on economic circumstances in order to best achieve the Committee’s dual mandate. Similarly, makeup strategies could be implemented more flexibly in order to deliver more accommodation during a future downturn and through the subsequent recovery than what could be achieved with a mechanical makeup rule.”

This desire for flexibility was reiterated in the August 27, 2020 speech by the Chair at Jackson Hole. He noted

“In seeking to achieve inflation that averages 2 percent over time, we are not tying ourselves to a particular mathematical formula that defines the average. Thus, our approach could be viewed as a flexible form of average inflation targeting. Our decisions about appropriate monetary policy will continue to reflect a broad array of considerations and will not be dictated by any formula.”

The September 2019 minutes also highlighted the difficulties of binding future committees to the decisions of previous committees—a aspect of the time inconsistency problem discussed above. Equally important were the concerns that policies that entailed holding interest rates lower for longer could spur excessive risk-taking in financial markets, a concern that led to a modest increase in emphasis on financial stability in the new Consensus Statement.

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12 See the minutes from the September 17-18 2019 FOMC meeting, https://www.federalreserve.gov/monetarypolicy/files/fomcminutes20190918.pdf, which note that

13 https://www.federalreserve.gov/newsevents/speech/powell20200827a.htm

14 “Moreover, sustainably achieving maximum employment and price stability depends on a stable financial system. Therefore, the Committee’s policy decisions reflect its longer-run goals, its medium-term outlook, and its assessments of the balance of risks, including risks to the financial system that could impede the attainment of the Committee’s goals.”
Third, the FOMC expressed greater interest in policies that would address shortfalls of inflation relative to target, rather than those that might address previous overshooting of inflation relative to target:

“Several participants noted that makeup strategies could unduly limit the policy response in situations in which inflation had been running above 2 percent amid signs of an impending economic downturn. Accordingly, these participants favored makeup strategies that only reversed past inflation shortfalls relative to makeup strategies that reversed both past inflation shortfalls and past overruns.” [Minutes of the September 17-18, 2019 FOMC meeting].

Put more simply, as a matter of political economy, the Fed might indeed find it challenging to explain to the public that while we are in a recession and inflation is currently running at two percent, the Fed is currently keeping interest rates higher than it otherwise would, because inflation five years ago averaged somewhat above two percent.

Fourth, throughout, the FOMC made it clear that while they “never say never,” the likelihood of using negative short-term interest rates to address downturns was remote.

Thus with respect to interest rate policy, the suite of MPF options was narrowed to consider make-up policies that were focused primarily on inflation shortfalls, and were expected to be implemented somewhat flexibly.

3. A model-based analysis of “make-up” policies

Because make-up policies have yet to be implemented by almost any modern central bank (the Czech National Bank is a partial exception), assessment of their likely costs and benefits is necessarily a counterfactual and/or (as in this paper) model-based. The use of simple models is chosen in this paper, as some previous work relied on large and complex models whose structure and mechanisms can be difficult to unravel for the outsider. The models in this paper comprise a few central elements whose characteristics can be varied transparently to highlight key model-dependencies of conclusions.

The inflation specification employed in this paper takes on two variants. The first is a canonical New-Keynesian Phillips curve (NKPC), with hybrid forward/backward-looking components, driven in essence by an output gap measure:

\[ \pi_t = (1 - \mu)\pi_{t-1} + \mu E_t \pi_{t+1} + \gamma \tilde{y}_t \]  

(1)

Alternatively, inflation is determined by a mix of long-run inflation expectations and the output gap

\[ \pi_t = \pi_{LR}^t + \gamma \tilde{y}_t \]  

(2)

Where long-run expectations \( \pi_{LR}^t \) are determined as a weighted average of lagged inflation and the central bank’s inflation goal:

\[ \pi_{LR}^t = lr \bar{\pi}_t + (1 - lr)\pi_{t-1} \]  

(3)

\[ \text{A key example in this regard is the Board of Governor’s FRB/US model, which has been used in a number of studies. (Cites)} \]
This formulation specifies the extent to which long-run expectations are “anchored” on the long-run inflation goal, and correspondingly the extent to which both long-run expectations and realized inflation respond to lagged inflation.

Output is determined by either a New-Keynesian I-S curve, with hybrid forward- and backward-looking elements:

\[ \tilde{y}_t = (1 - \omega)\tilde{y}_{t-1} + \omega E_t \tilde{y}_{t+1} - \sigma (f f_t - E_t \pi_{t+1} - \bar{\rho}) \]  
\[ \tilde{y}_t = \omega \tilde{y}_{t-1} - \sigma (f f_t - E_t \pi_{t+1} - \bar{\rho}) \]  

The federal funds rate is determined by a fairly conventional policy rule, with two significant augmentations: (1) the ability to respond to either the deviation of the price level from its notional target path, or to average inflation, where the average can take a number of forms; and (2) in some cases, a response only to negative output gaps (equation 6b). The former obviously accommodates an examination of the alternative frameworks of interest. The latter reflects the Committee’s August policy framework statement, which made it clear that going forward, the primary (if not exclusive) employment focus will be on shortfalls of employment relative to full employment, not on overshooting of the same. Because the effective lower bound must be considered in the simulations that follow, we assume that the “notional” federal funds rate is determined by the rule, while the effective funds rate is the maximum of the ELB and the notional rate implied by the policy rule:

\[ f f_t^n = \rho f f_{t-1} + (1 - \rho_f)\left[\bar{\rho} + \bar{\pi} + a_{av} (\pi_t - \bar{\pi}) + a_{av} (\pi_{av} - \bar{\pi}) + a_{lev} (p_t - \bar{p}_t) + a_y \tilde{y}_t^\prime\right] \]  
\[ \tilde{y}_t^\prime = \tilde{y}_t; \text{or} \]  
\[ \tilde{y}_t^\prime = min[\tilde{y}_t, 0] \]  
\[ f f_t = \max[ELB, f f_t^n] \]  

The maximum function is implemented via a scaled semi-logistic function which allows a solution method that relies on continuous analytic derivatives.\(^{16}\)

\[ f f_t = (ff^n_t - ELB)/(1 + \exp (-k f f^n_t - k) + ELB) \]  

\(^{16}\) The function employed is \( f f_t = (f f^n_t - ELB)/(1 + \exp (-k f f^n_t - k) + ELB) \), which ensures that the funds rate is always \( \geq \)ELB. \( k \) is the scaling parameter that ensures that the function rises rapidly from zero to one as the notional funds rate moves from the region \(<\text{ELB}\) to \(= \text{ELB}\). A graph of the function appears below for intuition. The larger is \( k \), the better the approximation to a perfect nonlinearity at the ELB. In the figure below, the ELB is set equal to 0.125, and \( k = 15 \).

A similar function is employed to implement the minimum of the output gap and zero, \( \bar{\pi} + \tilde{y}_t^\prime = y/(1 + \exp(ky)) \).
The price level is equal to the accumulated inflation rates, while the target price level is the level that would prevail if, starting from a specific date, prices had risen steadily at the target rate of inflation:

$$\bar{p}_t = \bar{p}_{t-1} + 0.25\bar{\pi} \quad (8)$$

Average inflation is defined by

$$\pi^{av}_t = \pi^{av}_{t-1} - \left(\frac{1}{n}\right)\pi_{t-n-1} + \left(\frac{1}{n}\right)\pi_{t-1} \quad (9)$$

where $n$ is the number of periods over which the average is taken, an important policy choice for this class of make-up policies. Another variant averages inflation symmetrically around the current period, with half of the weight on past and half on expected future inflation.

**Key margins of model dependence**

**Inflation modeling**

Prior to the Great Recession, the most widely-used inflation specification among central banks (and most academics) was the NKPC outlined above. The essence of the model is twofold: (1) firms cannot or do not reset all prices in any given period, and (2) as a consequence, firms set prices today with respect to expected conditions over the horizon for which prices will be in effect. The simplest version of the specification implies that inflation today is a function of the discounted sequence of output gaps extending into the future, proxying for the economic conditions that matter most to firms (the output gap, under certain conditions, will be a reasonable proxy for the marginal cost of producing).

A more recent entrant to the price-modeling field is the “anchored expectations” model, which posits that inflation is tied to long-run inflation expectations, with an adjustment for current demand conditions, as reflected in equation (2) above. Why might long-run expectations enter an empirical inflation specification? They could serve as a sign of credibility in the ability of the central bank to attain its inflation goal—if long-run expectations drift away from the inflation goal, it could be because agents no longer have faith that the inflation goal is attainable. This concern certainly motivates the monitoring of long-run expectations by many central banks, including measures that capture the expectations of households, businesses and financial markets.

But the appeal to credibility as a rationale for monitoring long-run expectations implies an indirect link between expectations and inflation. Contrast this with the specification in which long-run expectations enter as a direct determinant of inflation, as in this equation:

$$\pi_t = E\pi_t^{LR} + \gamma y_t + \epsilon_t$$

As suggested above, this specification is becoming quite widely-used among central bankers (and to a lesser extent, academics). While this model holds some intuitive appeal, it deviates in important ways from the canonical model. In particular, the role of short- to medium-run expectations of inflation (or, implicitly, of short- to medium-run expected output gaps) is absent in the model. Note also that, in a standard model, long-run expectations already enter implicitly, as they stand for the public’s belief that the central bank will return inflation to its announced target. Thus in a rational
The appeal of the long-run expectations model appears to lie primarily in its empirical success: Over the past twenty years in the U.S., inflation has behaved as if it has deviated more-or-less randomly around a long-run expectation of inflation nearly fixed at 2%, as in Figure 1 below. And as a practical matter, some measures of long-run inflation expectations have indeed not deviated far from the Fed’s 2% inflation goal. Thus an intuitive explanation of inflation’s behavior is that the Fed’s monetary policy actions have led private expectations to remain firmly anchored at 2% in the long run, which in turn has kept realized inflation from deviating to far from 2%.

A nearly trivial model that makes inflation a function of long-run inflation expectations (10-year inflation expectations taken here from the FRB/US model) and a simple measure of the output gap achieves considerable success in fitting inflation over this period:

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17 Explain a bit more here.

18 The model also includes a measure of the change in the relative price of non-oil imported goods, which is important for a few quarterly observations in which the change in import prices was sizable.
Because both inflation and long-run expectations are quite stable over this period, the long-run expectations serves primarily as an intercept in this simple regression model, as noted in Fuhrer (cite). Nonetheless, the model does reasonably well, whereas a model that relies more heavily on short-run expectations and the output gap did considerably less well during the Great Recession.

Thus the model serves as a convenient explanation for the relative stability of inflation during the last recession—because long-run expectations were well-anchored, inflation stayed relatively calm during the recession, despite the rise in unemployment to its peak of ten percent. An interesting question is how structural this model is—not in a purely academic sense, but in the sense of remaining a valid description of the economy across multiple business cycle episodes. We are in the process of testing that hypothesis as this is written. Suffice it to say that this widely-adopted model of inflation dynamics brings with it a number of questions. The question of underlying structural soundness is particularly salient in the context of considering policy regimes that have never been practiced. This is the essence of the concerns voiced by Robert Lucas in his now-famous Critique (1976). It is also an important question as we consider the stability of inflation dynamics in the wake of the current COVID-induced crisis. In particular, the notion that long-run expectations will keep inflation stable during such an episode should be viewed with some skepticism. Indeed, long-run expectations have slipped somewhat already, but regardless, the extent to which they act as a brake on realized expectations cannot be relied upon.

More on long-run expectations

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19 There is some debate on this point: DelNegro et al (20xx) suggest a DSGE model with a NKPC tracks inflation well, but that depends strongly on the definition of the output gap and the definition of potential output. Using the CBO measure of potential output—which is not ideal, but is widely-used—and applying a pre-crisis Phillips curve coefficient to the implied gap, inflation should have fallen below zero in fairly short order during the crisis (see my comments on King 2017). While there is room for debate, my sense is that it is hard to square such a model with the past decade's history of inflation.
So where do long-run expectations come from? In a canonical RE model, they are the model’s prediction of inflation long into the future. If the central bank is pursuing appropriate policy, in the sense that it responds to inflation vigorously enough to eventually get inflation to its target (in many models, this amounts to adhering to the “Taylor principle”, Taylor (1993)), long-run expectations will indeed be centered on the central bank’s inflation goal. Depending on the long-run concept, they can deviate temporarily from the inflation objective, but not indefinitely.

In the more recent anchored-expectations models, long-run expectations are often modeled as quite inertial—essentially long moving averages of past inflation. Inflation realizations can affect long-run expectations, but only to a limited extent. In turn, the long-run expectations anchor realized inflation. The essence of such models is captured in the specification laid out above, in which LR expectations are a weighted average of the inflation goal and recently realizations of inflation. Importantly, but depending on other specifics of the model, too large a weight on recent realizations can lead the model to become unstable—i.e. unexpectedly low inflation that persists for long enough can drag down LR expectations, further dragging down inflation, and making it difficult (in some cases impossible) for monetary policy alone to bring inflation back to target. This is especially true when the central bank is near the effective lower bound constraint for its policy instrument.

How much faith can one place in the stability of this quasi-model across significant changes in economic environment? Robustness to the evolution of the economy during the COVID crisis is discussed above. In the context of alternative monetary policy strategies, one might wonder if (a) the pursuit of a goal that promises above-target inflation for a period would affect the formation of inflation expectations; and (b) if the Fed were able to attain its inflation goal, consistently, in coming years, would LR expectations adjust more quickly to that reality, rather than continuing to feed in realizations from many years ago, as in the current specifications? In short, because of the relatively short sample over which the model has been used, and because of its lack of structural underpinnings, central banks need to be careful in using an anchored-expectations inflation specification going forward.

How expectations are formed matters

An even longer-standing debate about inflation dynamics rests on the extent to which inflation is (loosely speaking) backward- or forward-looking. This jargon is really shorthand for how sophisticated are the expectations implicit in these models. More “forward-looking” models imbed rational expectations to a greater extent. Such expectations essentially compute the future path of all variables that is consistent with the model specification, and use those to determine price and output in the model. More “backward-looking” models assume that expectations are formed using less-formal averages of recent data, rather than imbuing the agents with full knowledge of the (presumed correct) model specification. This debate extends to the expectations that enter the determination of output as well. As simulations below show, this margin can imply significant differences in the behavior of the economy in response to shocks. It also can change quite dramatically the extent to which alternative monetary policies achieve success in attaining inflation or output goals.
Interestingly, the differences are most prominent when output is determined by a backward-looking process. This is due in large part to the relatively small estimated slope for the Phillips curves used in this paper (and most others); it implies that differences in policy settings and the attendant changes in output will have relatively small effects on inflation. The same is less true for output.

The debate over how rational are expectations is ongoing. A case can be made that expectations are close enough to rational during tranquil or normal times. But an interesting question is what happens to expectations during times of significant upheaval—a serious recession, a financial crisis, or a global pandemic, for example—when uncertainty about many things is heightened, and some evidence suggests that horizons are shortened (the public does not look far into the future in thinking about today’s decisions). For these reasons, it is of particular interest to examine how robust are the benefits of alternative policies to different expectations assumptions. This interest is heightened by the observation that the benefits of make-up policies are linked quite closely to expectations behavior. In particular, it is the promise of delivering inflation in the future that can help both to anchor inflation expectations, and to lower ex ante real interest rates today, reducing the severity of an economic downturn. While benefits do not rely on expectations being fully rational, significant departures from rationality can quite significantly alter the conclusions about the benefits of make-up policies.

**Results**

For the purposes of illustrating a number of the key conclusions, this section focuses on the results of simulating model variants in response to a standardized recession scenario. The initial conditions for each simulation are as follows:

- Inflation begins at 1.5%, modestly below the assumed two percent inflation goal;
- The output gap begins at zero, but is hit by a sizable aggregate demand shock (roughly equivalent to a 3.5 percentage point increase in the unemployment rate—a significant but, by current standards, not dramatic downturn);
- The federal funds rate starts at one percent, roughly where it stood at the beginning of 2020.
- The assumed equilibrium real funds rate is 0.5 percent, implying an equilibrium nominal funds rate of 2.5%.
- Long-run inflation expectations are initialized at a well-anchored 2%, equal to the inflation objective.

For these baseline simulations, we consider three policy variants: conventional inflation targeting (with weight on the output gap as well), price-level targeting, and average-inflation targeting. In each case, the funds rate responds to a one percentage-point deviation of the price-stability target (inflation, price level, or average inflation) with a 1.5 percentage point change. The response to a one percentage point deviation in the output gap is 0.5 percentage points on the funds rate.

In mapping these simulations into the set of MPF’s under active consideration by the FOMC, two points are worthy of note: (1) The simulations used to compare these frameworks considers only an episode in which inflation falls short of the inflation goal; (2) The simulations employ rules,
about which the Committee expressed reservations. However, it is difficult to know how to model a truly judgmental process. In addition, the simulations employed by the Federal Reserve staff also employed simulations to approximate the use of these alternative frameworks. These simulations should give a reasonable assessment of the quantitative benefits that might arise if such frameworks were employed.

The simulations also consider three model variants. The first is a canonical NK hybrid model with one-half weight on the forward- and backward-looking elements. The second replaces the NKPC with an expectations-anchored Phillips curve, as described above. The third uses the anchored-expectations Phillips curve and the so-called “backward-looking” IS curve, also outlined above. Because there remains considerable uncertainty about these key aspects of macroeconomic structure, variations across model specifications are of interest, as are variations across policy regimes. Because the goal of alternative policies is to anchor expectations, keep inflation closer to target, and reduce the output/employment cost of recessions, we will examine the extent to which the policies achieve these goals, under different modeling assumptions.

Figure 3 displays the results under a canonical inflation-targeting regime, which by definition makes no attempt to make up for past deviations of inflation from target. The dashed black lines show the outcome under an “anchored expectations” inflation specification. The virtues of such an inflation process, if they are realistic, are obvious: The return to the inflation goal is faster, the output gap persists as briefly as the NKPC model, and the funds rate consequently can return to normal more quickly. The backward-looking model, in contrast, implies a much longer time to return to the inflation goal, a more prolonged period of economic contraction, and thus requires that the Fed depress the funds rate for considerably longer. While this policy scenario is not the one of most interest for this paper, it serves to illustrate as an introduction to the differences in outcomes implied by different modeling assumptions.

Note that in both the NKPC and the anchored-inflation models, the inflation rate exhibits a small amount of “overshooting.” Of course, this does not arise because the central bank chooses to overshoot its inflation goal, making up for past shortfalls of inflation relative to target. Instead, it is an artifact of the interest rate smoothing in the policy rule. Because policy is constrained to adjust inertially under this rule, as inflation and output reach their goals, the interest rate is still constrained to see fairly close to last period’s interest rate, leaving a bit of stimulus in that is not required to attain the goals. The arguments around the apparent presence of interest rate smoothing, as well as theoretical arguments for why it might be valuable, lie outside the scope of this paper. For most of this paper, we take as given that the FOMC tends to respond inertially, although figure 3a displays the results of an exercise which considers the case in which it might not, such as in response to a particularly large and rapidly-developing recession (sound familiar?). Notably, there is no evidence of inflation overshooting in these examples. The output gap declines are less severe, and the funds rate lifts off from the ELB sooner than in the interest rate smoothing case.
Figure 3
Recession outcomes for different models, IT

Inflation

Output gap

Funds rate

Hybrid NK
ε = LR expecs
BL

Recession outcomes for different models, IT
Figure 4 displays the outcomes under an extreme or “infinite-memory” version of a make-up policy, as described above, price-level targeting (PLT). By comparison with figure 3, the degree of overshooting of inflation relative to target is more pronounced in this case, by design, as PLT makes up for all past deviations of inflation relative to target. The performance in terms of output is not significantly different from the IT regime. Of note is that, in order to achieve this extreme version of a “make-up” policy under the backward-looking model, the funds rate is pinned at its ELB for more than a decade. This seems an unappealing outcome, but more importantly, it highlights the importance of expectations assumptions in being able to implement make-up strategies, as well as in achieving macro benefits from such strategies. Implications for the price level are explored in more detail below.
Figure 5 examines outcomes for an average inflation targeting (AIT) regime, in which policymakers attempt to keep average inflation near the presumed 2% goal within a specific time window (here, it is five years). The outcomes for the output gap and the funds rate are not dramatically different from the other simulations, but inflation in this regime fluctuates over a longer horizon, as observations enter and drop out of the average inflation window, and policy responds to re-attain the desired average. Again, with the backward-looking specification, it takes longer for inflation and output to return to normal values, and the funds rate remains at the ELB for an additional 2-3 years. It returns to its equilibrium 6-8 years later than under the other two model alternatives.
One convenient way to summarize differences across model assumptions is to look at outcomes for the price level relative to its notional target level, as shown in figure 6. Pursuing a PLT strategy under anchored expectations and the rational expectations-based HNKPC, the price level returns fairly close to target within a few years. But under backward-looking expectations, the price level never attains its target path within the simulation horizon, which is why in figure 4 the funds rate remains pinned at its ELB indefinitely. Even though the inflation rate has returned to 2%, the BL model is unable to deliver enough inflation overshooting to return the price-level to its notional target path. The difficulty is less pronounced under AIT in figure 5, but it is still clear that some of the success of make-up policies depends on what one is willing to assume about expectations formation in one's depiction of the macroeconomy.
Because long-run inflation expectations figure prominently in most all current discussions of monetary policy strategy and success, figure 7 shows the long-run inflation expectations (as modeled in section xx above) for each of the policy strategies, and for each model specification. At least in theory, the PLT strategy implies greater variation in long-run expectations under anchored and NKPC inflation specifications. The strong commitment to return the price level to its path implies more prolonged ups and downs in inflation, which (according to the model) pulls inflation expectations up and down more so than in the conventional IT policy framework. Regardless of the policy regime, under backward-looking expectations, long-run inflation expectations always take much longer to return to target.
What to conclude from these exercises? First, the manner in which inflation (and other) expectations are formed matters quite significantly when considering the relative benefits of alternative policy strategies. In some cases, the pursuit of a more stringent make-up policy, coupled with backward-looking expectations, could imply inability to achieve the make-up goal for decades. In some simulations (not shown here), the model fails to converge at all—an outcome that is not realistic, as at some point fiscal policy would likely fill in where monetary policy fails, but still instructive as to the limits of monetary policy in an economy with less-than-theoretically-ideal agents.

4. **Innovation, Risk-taking and the link between FP and MP during the COVID-19 environment**

In the wake of the policy-induced economic coma that the COVID-19 pandemic has required, monetary policymakers have pursued policies that exceed the guardrails laid out in the Framework Review. In particular, policies that involve the indirect purchase of corporate bonds, municipal bonds, and small business loans (including nonprofit businesses) have been designed and
implemented. These were all enacted via the revised 13(3) process spelled out in the Dodd-Frank Act of 2010, and thus required the approval of the Secretary of the Treasury.

Recall that the Federal Reserve Act prohibits our taking anything other than government-guaranteed assets in our portfolio (although such assets may be used as collateral at the so-called discount window). The Fed circumvents this restriction by creating special-purpose vehicles (SPV’s)—entities that borrow from the Fed at low rates and purchase such assets, normally generating income by serving as a patient investor who earns returns on the purchased assets over time, especially once the crisis period has eased. The Treasury's role is to “backstop” these facilities—that is, to promise money to cover the first $xB of losses, protecting the Fed from bearing the first tranche of losses, should they materialize. It would be difficult (if not impossible) to conduct such lending programs without this Treasury aid.20

The Fed has set up SPV’s to purchase commercial paper, municipal securities, corporate bonds and loans to nonfinancial companies from private markets. In so doing, they make it possible for businesses and municipalities to raise funds via these vehicles when private agents are less willing to purchase their debt, due to the Knightian uncertainty about the evolution of the economy in the wake of the Covid-19-induced coma. The SPV’s are cushioned from losses in several ways: First, they are collateralized by the underlying securities, which we hope will not lose all their value. Second, even if some securities lose value in the short run, the Fed can hold them until maturity, in the hopes that their value will return when the economy normalizes. This strategy worked quite well during the Great Recession and financial crisis. Third, they earn a spread on the securities purchased relative to the cost of their funds. The income so generated can cushion against modest losses. And fourth, they are “backstopped” by the U.S. Treasury, which has pledged to bear the first slug of credit losses, should they occur.

While provision of liquidity of course matters for facilitating routine business functions (payroll and inventory financing, for example), an even larger concern is the extent to which the Fed has tools to stimulate and/or restore spending and employment. To be sure, helping private (and municipal) credit markets to place debt that supports economic activity will help. The Fed’s new “Main Street” finance program, which was announced in late March, previewed on April 6th, and specified more clearly on April 9th, will help in this regard, although that facility has modified its terms more than once, and is in its early days of implementation as of this writing. One goal of that facility is to complement the federal government’s “Paycheck Protection Program,” run through the SBA, which in its first round provided $350B of forgivable loans to small (employment less than 500) businesses to continue paying employees, rent and utilities. The first round was fully subscribed in a matter of days, prompting a second round of the program that provided an additional $310 billion for the same purpose.

The Fed’s new Main Street program has two components: The first provides term funding to banks that are lending under the PPP, freeing up bank capital for other purposes. The second will again set up an SPV that can borrow from the Fed, with the goal of purchasing up to $600B of loans to mid-sized businesses—firms that exceed the 500-employee size limit, and are thus ineligible for

20 Note that the Fed has not to date suffered a credit loss on any of its lending, through the discount window, the Term Auction Facility, or its numerous credit and liquidity facilities during the Great Recession.
the PPP—from banks that lend to such businesses.\textsuperscript{21} The originating banks must maintain a small (at least 5\%) stake in these loans. In addition to the Main Street program, the Fed announced a program to purchase up to $500B in loans directly from state and local governments. In all of these cases, the Treasury has pledged funds—from 7 to 13\% of the maximum size of the programs—to bear credit risk, should loans become delinquent or default.

The table below provides some details on the specific actions taken.

<table>
<thead>
<tr>
<th>Program</th>
<th>Sector targeted</th>
<th>Amount</th>
<th>Program description</th>
<th>Treasury stake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal Liquidity Facility</td>
<td>Municipal governments</td>
<td>Up to $500B</td>
<td>Two financing channels. Purchases short-term notes directly from states, counties (population&gt;500k) and cities (population&gt;250k). States may use proceeds to provide aid to counties and cities. Rate=OIS plus spread based on rating.\textsuperscript{22}</td>
<td>$35B</td>
</tr>
<tr>
<td>Primary Market Corporate Credit Facility</td>
<td>Investment-grade companies</td>
<td>$750B total for Primary and Secondary</td>
<td>Purchase bonds as sole investor or as part of a syndicate. Leverages Treasury equity at 10-to-1 for investment grade, 7-1 for below-investment grade.</td>
<td>$50B</td>
</tr>
<tr>
<td>Secondary Market Corporate Credit Facility</td>
<td>Below-investment grade companies</td>
<td></td>
<td>Leverages Treasury equity at rates from 3-1 to 10-1 depending on asset. Purchases to create a portfolio that tracks a broad market index of corporate bonds.</td>
<td>$25B</td>
</tr>
<tr>
<td>Main Street Lending Programs. Three for businesses, two for nonprofits (the latter not yet operational).</td>
<td>Small and medium-sized nonfinancial business and nonprofits.</td>
<td>Up to $600B</td>
<td>Loans, new or “upsized” are five year maturity, deferral of principal payments for two years, and deferral of interest payments for one year. Originating lenders</td>
<td>$75B</td>
</tr>
</tbody>
</table>

\textsuperscript{21} The current version of the program has five sub-programs that serve different segments of the for-profit and not-for-profit sectors.

\textsuperscript{22} The spreads by rating may be found in Appendix B of this document: 
Has the Fed crossed the Fiscal/Monetary boundary?

Due to the extraordinary nature of these programs, cooperation with the Treasury has been a necessity, for two reasons. First, such unusual programs are governed by the “13(3)” section of the Federal Reserve Act, as amended in the Dodd-Frank legislation, which requires the sign-off of the Treasury Secretary. More importantly, because the special facilities run by the Fed will hold private and municipal securities that bear some credit risk (risk of delinquent payment or default), the Treasury has provided public funds to backstop these vehicles—that is, to make the Fed whole in the event of losses to the portfolios held by these special vehicles. The amounts pledged by the Treasury typically cover the first 10-20% of any losses incurred in the Fed’s portfolio—similar to the “tranching” of losses that is common in mortgage-backed securitization. This federal government assumption of risk taken on by the Federal Reserve is an important example of fiscal-monetary coordination, an issue that has been debated for years, implemented in smaller measure during the financial crisis, and is now on the front burner in responding to the COVID-19 crisis.

Because such programs mean that the Federal Reserve takes on a measure of credit risk (after the amount that is buffered by the Treasury backstops), some suggest that such policies constitute fiscal policy. In the event of a default, by taking private-sector losses onto its own books, the Fed would be implicitly distributing federal funds differentially across borrowers at these facilities. That is arguably a flavor of fiscal policy.

However, it is important to distinguish these monetary actions, which contain a modest element of fiscal policy, from more traditional fiscal policy that directly grants funds (or alters tax policy) to private entities, rather than lending with the expectation of repayment. The Fed in these new programs is still intervening by lending, not spending (as Fed Chair Powell emphasized during a Brookings Institution-sponsored webinar in early April 2020).23

Because all of the securities involved in these programs entail some credit risk, they imply some risk that the central bank would incur losses through these programs, if the Treasury’s promise to bear the first losses is insufficient to cover all of the losses. While the probability of that outcome is low, it is not zero, and thus it raises the question of whether the central bank might end up bearing

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23 “…these are lending powers, not spending powers. … The Fed can only make secured loans to solvent entities with the expectation that the loans will be fully repaid,” but he noted further that “there will also be entities of various kinds that need direct fiscal support rather than a loan they would struggle to repay.” Hence the lending versus spending distinction. See Powell (2020).
private credit losses, which in turn calls into question the extent to which monetary policy has veered into the domain of fiscal policy.

To be clear, this issue differs from the classic concern about short-term instrument independence—the concern that members of Congress might exert pressure on the Fed to set its policy rate to achieve a political, rather than a macroeconomic goal. It centers instead on the extent to which the central bank through its monetary policy operations reallocates resources across sectors of the economy—the municipal, corporate and small business sectors, in this case. By potentially taking on some of the economic risk faced by these sectors, it could redistribute resources in a way that has traditionally been the province of fiscal policy.

A second important distinction is that (as the Chair emphasized in his remarks at a Brookings panel, held remotely), the Fed is exercising “lending powers, not spending powers.” Of course, direct spending across economic sectors would be a clear case of transgressing the monetary/fiscal divide. Lending differentially, with the credit risk entailed, is a different kind of animal.

Do these programs constitute the use of monetary instruments to conduct fiscal policy? This is debatable. In theory, all of the programs could entail the Fed bearing private sector risk for specific sectors of the economy, to differing degrees. That could reasonably be construed as fiscal policy. However, the odds that the Fed actually incurs such losses are small. As a practical matter, these are likely to run as lending programs with modest losses, any of which will be borne (appropriately) by the Treasury, or covered by earnings accruing to the SPV. If so, then they—as a practical, not a theoretical matter—differ little from previous 13(3), SPV-based indirect lending programs.

While these recent forays into municipal securities, corporate bonds, and indirect business lending may not be the new norm, they have made it clear that, in a serious downturn, depending on the amount of conventional and balance sheet “policy space” available at the time, these previously taboo options are not completely off the table.

**A second margin of monetary/fiscal interaction: the Fed’s Balance Sheet**

As the past dozen years have made clear, the Fed’s balance sheet and the Federal government’s balance sheet are intertwined. As a mechanical matter, earnings from the Fed’s portfolio, after subtracting operating expenses, are returned to the Treasury. But more importantly, the balance-sheet policies that the Fed has pursued rely primarily on changing the mix of publicly-held and Fed-held securities—both the overall volume held by the Fed versus the public, and the mix of maturities held by the Fed versus the public.

But of course it’s not just the Fed that can influence that mix. The flow of new issues of Treasury securities is determined by the Federal government’s overall financing needs. Thus changes

24 Chairman Jerome Powell (2020).
in the fiscal position of the government will change the mix of securities held by the public, absent any Fed action. But so too can changes in the Treasury’s debt management program: For a given annual financing need, the Treasury can choose what maturities of securities it uses to meet the need. This can also change the maturity mix of Treasury securities available to the public.

The importance of this observation is that it makes the effectiveness of Fed balance sheet policies dependent on the actions of the Treasury debt managers. If the Fed swaps short for long securities to depress long rates by reducing the amount of long securities available to private purchasers (raising their price, lowering their yield), the Treasury can issue more long securities, potentially offsetting or erasing the desired effects. The Treasury is more likely to issue long securities when long rates are low, hence the possibility for an unfortunate dynamic: As the Fed moves to lower long-term rates, the incentive for the Treasury to increase the issuance of long-term securities increases, muting the Fed’s intended effect, absent coordination.

Such considerations might constitute grounds for cooperation between Treasury debt management and the Fed, a potential that has not been realized to date. The reluctance stems at least back to the Treasury Accord 1951.

Congress and the Fed: How far can a new MP framework go without Congressional approval?

As noted in our Brookings paper (Fuhrer, Olivei, Rosengren and Tootell 2018), the question of the appropriate level of involvement of Congress in entertaining and implementing changes to the MP framework is unresolved. In the move towards adopting an explicit numerical inflation objective under Chair Bernanke, a number of behind-the-scenes meetings helped the Fed and Congress agree on a level for the inflation target that was consistent with the notion of “price stability” that is explicit in the Federal Reserve Act. Policies that advocate a prolonged and (perhaps) intentional deviation of inflation above the 2% goal might stretch the current agreement between Congress and the Fed about what constitutes price stability. Make-up policies that embody an asymmetric objective to make up only past deviations of inflation below target might run a further risk of stretching the agreement between Congress and the Fed.

Interestingly, the “Fed Listens” sessions held in 2019 entailed little participation from Congressional representatives. In the process of evaluating the MPF, it has been necessary to balance instrument independence with medium-run accountability to the public, through Congressional representatives. Specifically, policies that may stretch the definition of “price stability” in the FR Act might require Congressional buy-in—perhaps not a formal approval, but certainly consultation. Certain “make-up” policies may stretch the definition of price stability from Congress’s perspective, depending on how they are implemented. For example, if such policies

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25 See “Fed Listens: Perspectives from the Public (2020)” a summary of the Fed Listens events held at all twelve Reserve Banks and the Board of Governors. The convening at the New York Federal Reserve was the only gathering to include Congressional district staff. No Congressional representatives attended any of the gatherings.

26 It is well-known that Chair Bernanke engaged in quite a bit of behind-the-scenes work in 2011 to gain support for the notion that a 2% inflation goal is consistent with the Dual Mandate’s language of “price stability.”
explicitly promise periods of intentional (or, in a weaker form, at least sanctioned) inflation above 2% to make up for periods below 2%, this might not be viewed as consistent with price stability.

5. Conclusions

As suggested in the paper by Fuhrer et al (2018), the MPF is constantly evolving, sometimes led by advances in economic theory, sometimes forced by economic circumstance. While the concerns motivating the pre-pandemic MPF Review—low equilibrium interest rates, a low inflation target, stubbornly low inflation—remain, the pandemic has forced forays into MP instruments that were previously off the table. Those developments reflect two strengths of the Federal Reserve—its ability to adapt rapidly to changing economic conditions, and its willingness to innovate when doing so improves economic outcomes for the country, despite the possibility of taking on some risk. These strengths were honed and expanded under the current and the previous two chairs.

With respect to the tamer pre-pandemic review, several conclusions are warranted. First, the likely benefits of (judgmentally-implemented) make-up policies are modest at best. Second, those benefits—indeed the ability to attain stable inflation centered around two percent, with full employment—depends strongly on model assumptions about which we should be humble. In particular, how rapidly and rationally expectations adjust to changes, and how much anchoring long-run expectations provide, are assumptions whose validity we will learn more about through the current recession and recovery. The models used in this paper are complex enough to capture these features, but simple enough to highlight clearly the dependence of framework outcomes on these assumptions. Third, a higher inflation goal, whose benefits are sketched in this paper but discussed more fully in others, likely provides greater macroeconomic benefit than make-up policies—if a higher inflation goal can be attained in a reasonable amount of time. But what constitutes a reasonable amount of time can be informed by history: It’s important to recall that it took at least two decades for central banks around the world to reach their current two percent objectives. If one were to approach the attainment of a (say) four percent goal as a one- or two-decade program, then achieving that goal might appear more feasible.

With respect to the issues of monetary-fiscal interaction, this paper offers a pragmatic interpretation. Arguably of necessity, the Federal Reserve has embarked on new lending programs that once again blur the line between fiscal and monetary policy, inasmuch as they entail taking on credit risk that may be only partially borne by the U.S. Treasury. I would argue that this kind of fiscal-monetary interaction is not only low-risk, but likely beneficial, as such programs could not reasonably be enacted without Treasury backstopping. To stand by as the economy suffers a near-15% unemployment rate and a rapid decline in activity out of a fear that the Fed could run a very small risk of incurring credit losses seems a large sin. Pulling out all the stops to speed the recovery in the face of an unprecedented decline, at the low (in expected value terms) cost of incurring credit risk, seems a reasonable balancing of risks to me. To be sure, antagonists can argue that the Fed has blurred the lines between fiscal and monetary policy. But as a practical matter, because the risks of incurring credit losses are low, and because the severity of the downturn required prompt and aggressive action, such criticisms seem more academic than pragmatic to me.
Fortunately, in response to the current crisis, fiscal policy also acted vigorously and with alacrity. The unemployment benefits expansion, along with the PPP, arguably kept the unemployment rate from rising another five or ten percentage points. A critical issue, not addressed in this paper, is to what extent we can rely on fiscal policy to join the economic stabilization team in future recessions and crises. This question is even more important in the face of the likely persistence of challenges facing central banks around the world, limiting the policy space available to them to offset downturns.

The new Statement on Longer-Run Goals and Monetary Strategy embodies the outcome of this MPF review process. While non-economist citizens might not see much newsworthy in the document, in fact it incorporates some important changes in the conduct of policy. The goal is now to achieve inflation that averages two percent over time, making up for persistent shortfalls below two percent with periods of above-two percent inflation for a time. This implies periods in which interest rates will be lower for longer following recessions in order to achieve such overshooting. Policy will focus on employment shortfalls, not on overshoots. The latter appear to have had largely salutary effects on the labor force, with no tendency to build inflationary pressures. To be sure, concerns about financial instability will be a risk, particularly if prolonged periods of low interest rates encourage excessive risk-taking. And the overall difficulty in affecting inflation, given the widely-documented flatness of the Phillips Curve, remains a challenge.

Importantly, it is unlikely that these changes provide monetary policy with all the tools it needs to offset future downturns. This implies there is more to be done: to raise the inflation goal, to clarify the fiscal/monetary partnership that has been required to undertake a variety of lending programs that entail credit risk, and to put fiscal policy more firmly on the table as a countercyclical policy tool. The recession that we are in as of writing induced a significant fiscal response, with clear stabilization benefits. One hopes that this will become more the norm in combatting downturns in the future, as it is clear that there are limits to what even the most creative monetary policymakers can do to stabilize employment and inflation in the current economic environment.

References


