



A New Framework for Targeting Inflation: Aiming for a Range of 2 to 3.5 Percent

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EXECUTIVE SUMMARY

In response to a decade of persistently low employment and inflation, the Federal Reserve in 2019 changed its framework to Flexible Average Inflation Targeting (FAIT). This current framework allows inflation to temporarily overshoot the Fed's 2 percent inflation target, but still requires the Fed to bring inflation back to 2 percent. However, given the experience of both the slow recovery from 2010 to 2019 following the Great Recession, and the high inflation following the COVID-19 disruption and recovery, a 2 percent inflation target is not an adequate framework for achieving both maximum employment and price stability.

This brief calls for changing the Federal Reserve's policy framework to target an inflation range of 2 to 3.5 percent, using the core personal consumption expenditures (PCE) deflator. In this new framework, the Fed should also target employment shortfalls and see through the effect of sectoral supply shocks on inflation. This framework would have several benefits:

- A range of 2 to 3.5 percent inflation would generate higher employment on average. During a recovery, the Fed can overshoot 2 percent when raising inflation from below, minimizing the risk of tightening before full employment is reached. When bringing inflation down from high levels, a target range allows inflation to settle at a moderate level while maintaining high employment levels, minimizing the risk of overcorrecting and generating a recession.
- An inflation range preserves price stability. Keeping demand-driven inflation at or below 3.5 percent prevents accelerating dynamics, and if full employment is achieved at only 2 percent inflation, a range does not require the Fed to raise inflation.
- Supply shock–driven inflation does not generate self-sustaining inflation, so the Fed should not tighten monetary policy in response to large sector-specific supply shocks. The Fed also does not need to react to small fluctuations in inflation due to noise or small shocks.
- International evidence suggests that ranges with upper bounds of 3 and 4 percent produce generally stable inflation outcomes.

This framework is informed by a model of a nonlinear Phillips curve, which this brief develops in detail. Under a nonlinear Phillips curve, the relationship between inflation and unemployment is not constant: When aggregate demand is low, changes in demand mostly affect output and employment while inflation remains low and stable. However, when the economy is closer to full employment, further increases in demand mostly contribute to inflation. This means that in times of high demand, central banks can cool demand-driven inflation with small effects on output and employment. Compared to the current framework, an inflation range of 2 to 3.5 percent better allows the Fed to keep the economy close to full

employment while still minimizing the risks of accelerating inflation dynamics.

Much of the inflation over the last year has been driven by sector-specific supply issues. Negative supply shocks in one sector of the economy can raise price levels, and interest rate policy is poorly suited to address these sector-specific shocks. Therefore, this framework calls for “seeing through” supply shocks: the Fed should raise interest rates in response to demand-driven inflation but not in response to price increases from sector-specific supply shocks.

Lastly, this framework calls for maintaining the Fed’s emphasis on addressing shortfalls in employment, rather than a symmetric employment target. Due to the nonlinear nature of the Phillips curve, inflation may be near 2 percent even when employment is far below its maximum. The Fed should therefore wait until inflation has materialized to declare that the economy is close to maximum employment.

INTRODUCTION

In just the last decade, the US has experienced both the persistently high inflation we have seen of late, and sustained periods of labor market slack and low inflation. Following the COVID-19 pandemic, a myriad of factors pushed inflation to its highest point in 40 years. Desires to socially distance and avoid transmission of COVID-19 shifted the composition of demand away from services and toward goods, and supply chains were overwhelmed. Historically large and rapid fiscal stimulus expanded the purchasing power of households, and the Russia-Ukraine war engulfed two major commodity exporters. However, now that leading indicators of inflation in nearly every key sector have slowed or ceased accelerating, the Federal Reserve must decide how it will steer the economy back to low inflation and if it will preserve strong labor markets.

The risks of overtightening are substantial, and the ability to correct after overtightening has occurred is limited. As the US experienced during the unnecessarily long and painful recovery following the Great Recession of 2008 to 2009, demand shortfalls do not quickly resolve themselves. With a nearly complete stop to a growing working-age population, likely tempered productivity growth, continued high inequality, and unreliable fiscal stimulus after recessions, the economy is still susceptible to demand shortfalls that cannot be reversed with monetary policy alone.

This brief proposes a framework for the Fed to follow that includes three features: setting a target inflation range between 2 and 3.5 percent using the core personal consumption expenditures (PCE) chain index, seeing through the effect of sector-specific supply shocks on inflation, and targeting shortfalls from maximum employment. Other frameworks—including 2 percent inflation targeting, Flexible Average Inflation Targeting (FAIT), or nominal GDP (NGDP) targeting—each have limitations that increase the odds of unnecessary preemptive tightening, overstate the Fed’s ability to engineer small changes in inflation, or require compensatory undershooting and overshooting that are both technically difficult and politically unpopular.

The Fed needs a framework that is realistic about how precisely changes in inflation can be engineered, that does not require or generate fear of preemptive tightening, and that can respond robustly to a wide range of unforeseen shocks and circumstances.

The underlying model behind this proposed framework is a nonlinear relationship between output and inflation: When the economy hits full employment, further increases in demand result in rising prices with little effect on quantities. An economy that never hits full employment will, on average, have lower inflation, but also lower output and employment. As long as past inflation does not have too large of a direct effect on future inflation, this means there is a long-run trade-off between unemployment and inflation. A target range allows the Fed to be patient in removing stimulus in times of insufficient demand to allow the economy to reach production constraints, while in times of high demand providing a cushion of higher inflation in advance of future recessions.

Much of the current inflation is the result of sector-specific supply shocks that monetary policy is not well equipped to address. While there are many policies that should be pursued by legislation or executive order, this brief focuses on how the Fed should respond now and what its framework should be in the long run, taking as given its current mandate of price stability and maximum employment.

EVIDENCE ON HOW US INFLATION WORKS

Nonlinear Phillips Curve

The underlying model for this brief is fundamentally one of a nonlinear output Phillips curve, where if nominal spending rises above full employment at current prices, then additional increases in spending will primarily translate into inflation. However, below full employment,

changes in nominal spending primarily affect real activity.¹ We will often not know how far the economy is from hitting full employment until it is reached. Individual sectors also face increasing costs with higher output, and sector-specific supply shocks can drive prices in a sector up (or down) regardless of the level of aggregate demand.

Endogenous Attention and Inflation Volatility

When inflation is low, neither consumers nor firms need to worry about the exact rate of inflation. However, as inflation increases, the stakes of not paying attention are likely higher. Bracha and Tang (2022) show that households pay more attention to inflation when it is higher. Korenok et al. (2022) find a threshold for attention to inflation around 4 percent in the US. Bernanke (2010) worries about greater volatility of inflation when trend inflation is higher. The Bank for International Settlements (BIS) (2022) argues that inflation responds less to shocks in low-inflation regimes. Amiti et al. (2022) show that pass-through of costs to prices increased during the period of higher inflation since 2020.

This evidence suggests that an economy with 6 percent baseline inflation will respond in a more volatile way to shocks than an economy starting at 2 percent inflation. This high volatility can have substantial costs. High inflation volatility makes long-term planning and agreeing to long-term contracts, such as mortgages or other kinds of long-term lending, more difficult. Individual households will also differ in how protected they are from inflation, so sudden changes in inflation can be particularly painful for households whose income does not grow with prices. Given these risks, as well as the general unpopularity of inflation, central banks should avoid allowing extended periods of high inflation.²

¹ Phillips (1958) originally drew the relationship between inflation and unemployment to be nonlinear. Guerrieri et al. (2021) demonstrate that this nonlinearity in the aggregate Phillips curve can be present even if the binding constraint is in just one sector, rather than a generalized cost increase due to stretching aggregate labor supply. Boehm and Pandalai-Nayar (2022) find evidence that industry cost curves are convex. Downward nominal wage rigidity plays an important role in creating nonlinear Phillips curves in Daly and Hobijn (2014) and Eggertsson et al. (2019), and the latter considers secular stagnation. Lindé and Trabandt (2022) show that when firms face real rigidities, optimal pricing behavior leads the Phillips curve to steepen when output is higher, and the Phillips curve is particularly flat in regions where nominal interest rates are stuck at zero. Gagnon and Collins (2019) and Forbes, Gagnon, and Collins (2021) show that the Phillips curve flattens when unemployment is high and when inflation is low, in the US and globally. Ashley and Verbrugge (2020) find that the Phillips curve steepens when the unemployment rate is low.

² Much of the academic literature estimates that the welfare costs of inflation come from price dispersion. Coibion et al. (2010) argue that a target below 2 percent is optimal. Blanco (2021) shows that the welfare cost of price dispersion under menu costs is quite a bit less and finds an optimal target of 3.5 percent.

Weakened “Ratcheting” of Past Inflation into Future Inflation

One of the greatest concerns in managing inflation is that past inflation will affect price and wage setting in a way that generates broad future price increases. This is particularly unpleasant in the context of supply shocks: If one sector has a negative supply shock that raises prices in that sector, and if wages are indexed to overall inflation (or if realized inflation affects expectations that then affect price setting in the future), then sector-specific supply shocks can generate broad and self-sustaining inflation.

However, with the decline of cost-of-living adjustments (COLAs) in collective bargaining agreements, few workers have arrangements where changes in the aggregate price affect wages directly.³ Further, there is a general lack of micro evidence that inflation expectations affect firm pricing decisions directly,⁴ and to the extent that they do, the expectations are slow-moving and based on sectoral rather than aggregate prices.⁵

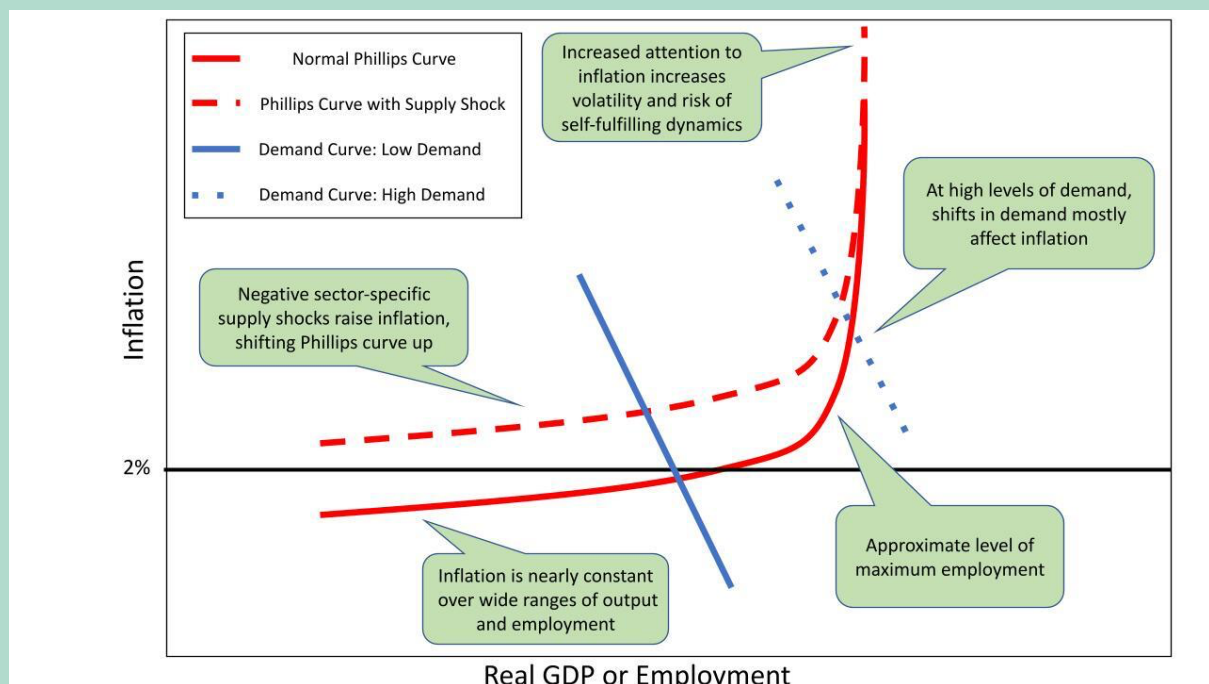
3 The rise of gas prices in June–July 2022 and the corresponding drop in “real wages” is a good example where wages do not respond to sector-specific price shocks that move aggregate price indices. del Canto et al. (2022) find essentially no pass-through of oil shocks to wages.

4 Boneva et al. (2019) and Coibion et al. (2018) provide two examples of estimates using microdata, with mixed evidence on the effect of inflation expectations on price setting.

5 There is significant uncertainty, both empirically and theoretically, about the influence of inflation expectations on inflation and the causal channels of inflationary spirals. Rudd (2022) argues against expectations as having weak theoretical and empirical support, instead arguing that inflation spirals only if wages rise in response to higher cost of living. Werning (2022) shows theoretically that the effect of inflation expectations on inflation differs dramatically based on the underlying assumptions about price rigidity. Sahm (2022) emphasizes that expectations of high inflation are risky only if behavior changes, such as households wanting to make large purchases before prices rise, or high inflation lowering expected real interest rates and stimulating investment. To prevent accelerating dynamics, this framework calls for raising nominal interest rates at least one-for-one with inflation when demand-driven inflation is above 3.5 percent.

A Model of a Nonlinear Phillips Curve

[Here](#), I derive a model with a nonlinear Phillips curve, assuming a two-sector model in which services are produced with only labor, goods are produced with both labor and capital/other intermediates, wages are sticky downwards, and households can borrow from the future to spend today. Figure 1 demonstrates the nonlinear relationship between employment or real GDP and inflation. The red, upward sloping curved lines show different levels of supply, and the downward sloping blue lines show different levels of demand. The supply curves show that changes in demand (shifting the demand curve left and right) have small effects on inflation below full employment, but after a certain point, inflation rises quickly with more demand. Shifts in the supply curve show how spending and the price level change in response to a negative supply shock in the goods sector, such as a chip shortage or energy crunch. The supply curve shifts up, raising the rate of inflation for any level of employment.



Wages and Inflation

Taking the long run as a starting point, wages and prices are likely to move together: Labor shares of income are not too different across time (Rognlie 2015) and across countries, at least among rich countries (UNECE 2022). But there are caveats to this.

Wages are not always linked to prices one-for-one, especially in the short run. Prior to the pandemic, there was a tight relationship between the prime-age (25 to 54) employment-to-population ratio and *nominal* wage growth. There is a good deal of research showing that quits and wage growth (even for those staying in jobs) are tightly correlated, as wages increase when employers face more competition for workers. Since nominal wage growth is recently more related to labor market tightness than price inflation, tight labor markets can increase the labor share of income and particularly raise wages for low-wage workers. Fluctuations in goods prices, especially energy, seem to have almost no effect on wages, and so inflation-adjusted wages are not a good short-run indicator for the level of labor demand.

While wages and prices may not always move in lockstep, they are still related. Times of high demand are periods during which firms likely want to raise both wages and prices. Research (Heise et al. 2022) also suggests that pass-through of wage costs to prices is likely much higher in the services sector, and quite low in the goods sector. It appears that the pass-through of wages to goods prices may have recently increased (Amiti et al. 2022), suggesting that pass-through may be higher when inflation is high. On the spending side, rising wages give households the spending power needed by firms to raise prices. However, the channel linking prices back to wages is likely quite weak now: While some employers may provide cost-of-living increases voluntarily, the share of workers covered by cost-of-living adjustments in collective bargaining contracts has declined drastically.

Given that higher demand will likely raise prices and wages, and that rising wages both affect firms' costs and give households the purchasing power to afford higher prices, it is easy to see how increases in wages, prices, and nominal demand can be *self-sustaining*, particularly in the services sector, but will not generate a cycle of *increasing* inflation. Absent new supply shocks, further increases in inflation would likely require new sources of demand such as an investment boom or further fiscal stimulus, both of which have stalled or receded in the last few months.

In total, the current nominal wage growth of around 5 percent may be consistent with 2 percent inflation for a short period while shocks in both durable and nondurable goods

sectors unwind. However, given the tight relationship between wages and services inflation, and since services account for around two-thirds of consumption spending, current rates of wage growth would require unprecedented levels of goods deflation to be consistent with 2 percent total inflation. If the main variable driving wage growth is aggregate demand, then annual nominal wage growth likely needs to be around 3 to 4 percent in the long run to be consistent with the proposed target inflation range.

Demand-Driven Recessions Reset Inflation

In each of the last four recessions that had a significant component of falling demand (1991, 2001, 2008, and 2020), inflation fell at the outset of the recession. Downward nominal rigidities are likely to prevent outright deflation, and a fall in demand will likely mean that growth in wages and prices will fall to a low and positive level.

Putting the Pieces Together: A Long-Run Tradeoff between Inflation and Employment

This section has identified three key features of inflation in the US: a nonlinear Phillips curve, weak ratcheting of past inflation into future inflation, and inflation resetting after demand-driven inflations.

Collectively, these features mean that an economy that remains below potential will have a lower long-run average of inflation and employment than an economy that occasionally bumps up against full employment. That is, there is a long-run trade-off between average inflation and average employment. If monetary policy is successful in bringing the economy to full employment, then we should see inflation periodically rising above 2 percent. As long as inflation is not too high so as to dramatically increase the attention paid to it, the Fed can sustain higher levels of employment without creating spiraling inflation dynamics.

Interpreting Current Inflation

In addition to standard arguments about supply and demand, various writers have emphasized two other main reasons for rising prices: Demand reallocation due to COVID-19 and rising markups and corporate profits (Owens 2022). Guerrieri et. al. (2021) show that if demand shifts from the services sector to the goods sector, prices will rise in the goods sector but not necessarily fall in services, raising overall prices. On the concentration front, firms may take advantage of turbulent times to raise prices more than costs have risen (Konczal and Lusiani 2022). When prices are changing quickly, consumers may become less price sensitive because it is hard to keep track of relative prices, and order backlogs of competitors may temporarily lower customers' price sensitivity.

While the effect of different shocks on inflation likely cannot be neatly decomposed, it appears that COVID-19 demand reallocation and sector-specific supply shocks (including the war in Ukraine) were likely the largest factors that led to the headline consumer price index (CPI) figure peaking at 9 percent in July. Given the continued high profits through the summer of 2022, companies were almost certainly pricing farther above average costs than before.

That said, demand is still playing a significant role in current inflation: Given wage growth of around 5 percent, it seems likely that inflation would likely be around 4 percent even if the economy had not been subjected to any supply shocks or supply chain constraints. However, through the lens of the nonlinear Phillips curve model, moderate decreases in nominal demand can generate substantial decreases in inflation without harming employment or output. We have already seen that the quits rate, which predicts nominal wage growth, has moderated without increases in the unemployment rate. This supports the hypothesis that a “soft landing” is possible and that a large recession with high unemployment is not necessary (Eggertsson 2022) to bring inflation down.

EXTENDED PERIODS OF WEAK DEMAND ARE STILL A MEDIUM- TO LONG-TERM RISK

Over the last decade, many writers have argued that the private sector is unlikely to achieve full employment at positive nominal interest rates—often referred to as secular stagnation. Four main factors make the return of persistent demand slumps that cannot be fixed with low interest rates more likely: population growth, productivity growth, inequality, and unresponsive fiscal policy.⁶

Population projections do not favor a return to higher total growth rates: The United Nations Economic Commission for Europe (2022) projects that the US working-age population will be flat for the rest of the century. The possible productivity boom that many speculated may occur due to innovation in response to the COVID shock seems to be fading (Federal Reserve Bank of St. Louis 2022), and research seems to affirm that ideas that generate productivity growth are getting harder to find (Bloom et al. 2020). Though so far inequality has fallen during COVID and the recovery, it is still very high and likely dampens spending (Mian et al. 2021) and inflation. Lastly, with low odds of new legislation for automatic fiscal stabilizers, it is far from a guarantee that Congress will employ countercyclical fiscal stimulus that is sufficient to offset future recessions.⁷

As we saw from the slow pace of recovery from 2010 to 2019, it can take a long time for depressed labor markets to recover, especially when interest rates are stuck at zero. The costs of slack labor markets are enormous, especially for workers who are more on the margins of the workforce: Wages in low-wage occupations fall, the Black unemployment rate rises by twice as much as the white unemployment rate, formerly incarcerated workers and workers with disabilities find it disproportionately harder to find jobs, labor force participation falls, and recent college graduates are underemployed, among other costs. Given that the risks of extended periods of depressed labor markets will likely be high in the future, any framework should promote avoiding these episodes and exiting periods of slack labor markets as soon as possible.

⁶ Summers and Rachel (2019) additionally consider the length of retirement and size of government debt.

⁷ The response to the COVID-19 pandemic, where policymakers wanted to maintain households' income while effectively shutting down many in-person industries, is not likely to be representative of future policy responses to downturns.

FAILURES OF THE OLD FRAMEWORK: A 2 PERCENT INFLATION TARGET AND SYMMETRIC EMPLOYMENT TARGET

Point inflation targets generate risks of premature tightening in recoveries and can unnecessarily keep the economy below full employment. During the recovery from the Great Recession, the Federal Open Market Committee (FOMC) preemptively raised interest rates to head off future inflation, which in retrospect likely delayed the recovery. Discussions of when interest rates should be raised above 0 to 0.25 percent, dubbed “liftoff,” began as early as 2012 (Kocherlakota 2012), and liftoff began in 2015. The FOMC’s move to raise interest rates was explicitly preemptive: Given the “long and variable lags” of monetary policy and the estimated effect that unemployment below the NAIRU (non-accelerating inflation rate of unemployment) has on inflation, it was deemed necessary that the FOMC raise interest rates before inflation reached 2 percent. This rationale has carried through the Fed terms of both Janet Yellen and Jerome Powell. As the continued rate hikes of 2018 raised interest rates to approximately 2.5 percent, Powell reiterated the view that insufficiently raising rates led to the risk of future inflation. Higher inflation did not materialize, and in light of concerns about potential weakness in the economy, the FOMC reversed course in 2019 and lowered interest rates again to around 1.5 percent. In retrospect, many of these hikes were likely unnecessary, and the US recovery may have been stronger and faster if not for this preemptive hiking.

In addition to preemptive rate hikes, *anticipation* of preemptive tightening alone can have depressing effects. This can be seen in the dramatic appreciation of the dollar from 2014 to 2015, when liftoff of the federal funds rate did not occur until the end of 2015. Dollar appreciation depresses global trade (Boz et al. 2017) and likely depressed goods-producing industries from 2015 to 2016 (Irwin 2018).

AN UNSUCCESSFUL UPDATE: FLEXIBLE AVERAGE INFLATION TARGETING

In 2019, hoping to avoid the mistake of the previous recovery, the FOMC adopted a new framework called Flexible Average Inflation Targeting, abbreviated as FAIT. The principal concern with Flexible Average Inflation Targeting, and any sort of level targeting in general, is that make-up policy is going to be both politically unpopular and technically difficult to make happen. Here, make-up policy means that past misses from a target need to be balanced

by approximately equal misses in the other direction. This is particularly problematic once the economy has reached a Goldilocks zone, in which employment is high and inflation is low. For example, consider in 2019 when labor markets were tight and inflation was close to 2 percent. Average inflation targeting would require the Fed to generate excess inflation, simply for the purpose of making up past shortfalls. Given that inflation is extremely unpopular, generating inflation after the economy has already reached a good state will be hard for the Fed to publicly justify.⁸

Second, and particularly as it pertains to inflation, small overshoots and undershoots are likely difficult if not impossible to successfully engineer. As the Fed's experience of the 2010s demonstrates, it is hard to intentionally generate small amounts of inflation. Further, asking the Fed to generate a small amount of inflation, *only to reverse it in an orderly way*, is far too difficult a task given the lagged, uncertain, and time-varying effects of the tools at the Fed's disposal.

BENEFITS OF A TARGET RANGE

Compared to point inflation targets or some form of averaging, inflation ranges make converging to maximum employment while landing at a tolerable rate of inflation easier, both if inflation is below or above the target range.

If the economy is in a state of underemployment and low inflation, a target range enables the Fed to more reliably bring the economy back to full employment. Using the framework of a nonlinear Phillips curve, the level of output or employment at which inflation will rise is not known. In this case, the Fed can maintain an accommodative stance until higher inflation readings are observed. And while generating small amounts of inflation is challenging, future instances of hitting binding production constraints are likely to be less dramatic than the last two years: It's not every cycle that the US economy is struck by a global pandemic and supply chain meltdown. Targeting a range allows inflation to pass by 2 percent without creating concerns about preemptive tightening, and does not require surgical control over inflation or precise estimates of an elusive NAIRU. While it is not reasonable for the Fed to be able to stop inflation on a dime at 2 percent, it is reasonable to expect that the Fed can prevent inflation from exceeding 4 percent if inflation has first drifted to 3 percent.

⁸ Analogous concerns remain about making up for too much past inflation. If an economy with low unemployment and low inflation is achieved, would the FOMC try to generate disinflation and risk a recession, simply so that the average inflation is achieved? The FOMC has clarified that the current make-up policy is not symmetric: The committee seeks to make up for shortfalls in inflation, but will not bring inflation below 2 percent to offset periods of above-target inflation.

Starting from a period of higher inflation, there is likely also a benefit to settling into a moderately higher rate of inflation. Since inflation will likely fall in response to a future recession and setting the interest rate at zero will likely be insufficient to reignite demand, the Fed can provide itself some cushion by leaving inflation at a higher level.⁹

In addition to helping the economy maintain full employment, a range is helpful when policymakers are uncertain about the nature of the shocks generating inflation. When supply shocks are small or consumers shift demand across types of goods and services, it may be hard to infer the exact source of changes in prices. A range allows the Fed to not overreact to changes in inflation when the source of inflation is uncertain.

So why pick 2 to 3.5 percent as the boundaries of the range? Ultimately choosing limits can be arbitrary and would need to consider multiple risks and costs. Given that CPI is frequently above the PCE chain index, a 3.5 percent upper bound means that few CPI readings will be above 4 percent. If attention to inflation is endogenous and can increase the responsiveness of inflation to shocks, it can be risky to have high inflation. While the evidence is not conclusive, it appears that inflation in the mid-single digits is more likely to generate additional attention paid to inflation. Inflation above 4 percent also seems more likely to attract negative political attention that central banks may want to avoid. At the bottom end, inflation below 2 percent makes real interest rates insufficiently negative during zero lower bound periods, and the benefits of having inflation below 2 percent appear to be minimal.

International Evidence

Canada adopted an inflation target in 1992, and in 1995 formally adopted a “control range” of 1 to 3 percent, with a 2 percent midpoint. Australia adopted a target range of 2 to 3 percent, also in the early 1990s, where the central bank’s goal is for inflation to average in the target range over a medium-term horizon. Mexico has targeted 3 percent inflation plus or minus 1 percent since 2003.

⁹ Bianchi et al. (2021) show inflation ranges that are asymmetric around a policy target help offset the deflationary bias of the zero lower bound. They find that to stabilize inflation at 2 percent, the Fed would need to target a range of inflation from around 1.5 to 3 percent. Chung et al. (2020) explore benefits and cost of variance inflation range concepts.

Australia and Canada have both successfully maintained inflation within their target ranges, and inflation has not exceeded 3 percent for sustained periods of time, except for in the present COVID-19 aftermath. Mexico also broadly stayed within its target prior to the COVID-19 pandemic. There is no evidence that these target ranges are worse at preventing high and unstable inflation.

Additionally, in the business cycles of the last 25 years, the macroeconomic performance of Canada and Australia has arguably been better than that of the US. Australia famously went nearly 30 years without a recession, even though productivity growth was not meaningfully higher (O'Brien 2019) than in the US. Employment rates in Canada and Australia currently exceed rates in the US for both women and men, as employment growth has been higher in these countries since around 2000. In the US, women's labor force participation has been remarkably cyclical, unlike in Canada and Australia, suggesting that poor macroeconomic conditions have depressed not only employment but also participation.

While the bulk of the differences between countries is likely due to exposure to different shocks, and labor force participation is affected by various social policies, it would be hard to argue that Canada and Australia's overall economic performance has been worse in any way. The risks stemming from switching to a target range with a moderate upper bound therefore seem quite low.

“SEEING THROUGH” SUPPLY SHOCKS

Monetary policy is not a good tool for dealing with sector-specific shocks: If there is a chip shortage, it makes little sense to bring down used car prices by making workers poorer. This is in general true in the nonlinear Phillips curve model: Supply shock—driven inflation is very costly to address with general demand policy. The ideal policy response is therefore to “see through” supply shocks, where one-time supply shocks increase inflation temporarily, leading the path of the price level to permanently increase if the shock is permanent but revert to trend if the supply shock reverses.

Keeping interest rates unchanged in response to supply shocks is a good strategy if “ratcheting” mechanisms are weak: One-time increases in inflation due to supply shocks are unlikely to create self-sustaining high inflation. However, while the decline in cost-of-living adjustments makes seeing through supply shocks easier, it does bring bad news for wages:

The central bank is mostly powerless to increase inflation-adjusted wages in response to sector-specific supply shocks. Restoring real wage growth would require other interventions that specifically unblock supply in the constrained sector.

One possible guideline for how to steer inflation back into the target range is to aim for inflation to return to the target range within approximately two years, like Canada's six-to-eight-quarter (Bank of Canada 2016) timeline for returning to target. While supply shocks may not produce strong ratcheting dynamics, the risk of households and businesses paying more attention after inflation has been high for a long time is a serious threat. This means that eventually the Fed may want to try to lower inflation despite the supply shocks, but both the upper limit of 3.5 percent and an eight-quarter time horizon should allow significantly more ability to see through supply shocks than past monetary policy frameworks.

ADDRESSING SHORTFALLS IN EMPLOYMENT

Due to the nonlinear nature of the Phillips curve, low inflation is not informative about how far employment is from its maximum. For example, in 2011 and 2012, inflation was approximately 2 percent while the labor market was severely depressed. Therefore, this framework is incomplete without also specifying an employment target: The Fed should seek to undo shortfalls from full employment.

How then should the FOMC go about estimating full employment? There are arguably two indicators that work best: employment-to-population ratios and wage growth. In the recovery following the Great Recession, many economists made the mistake of using only the unemployment rate to gauge full employment; we now have clear evidence that labor force participation responds slowly to labor demand (Cajner et al. 2021).¹⁰ Therefore, using the peak employment-to-population ratio¹¹ from the previous business cycle as a benchmark will help prevent premature declarations of maximum employment.¹²

Second, the FOMC should monitor nominal wage growth as an indicator of both proximity to maximum employment and aggregate demand in general. While nominal wage growth can

10 The "maximum" level of employment may change even over short time horizons. For example, maximum employment was likely much lower in January 2021 than right now, as many individuals wanted to stay out of the workplace to minimize risk of contracting COVID.

11 The best measure is likely the prime-age (25 to 54) employment-to-population ratio to avoid effects from secular changes in the age distribution or employment rates among young or old cohorts.

12 Policymakers may want to consider concrete and specific causes for labor supply declines. For example, Goda and Soltas (2022) argue that approximately 500,000 people are out of the labor force due to long-term consequences of becoming ill with COVID-19. However, it is not known yet how permanent these effects will be, and effects tend to be larger among older workers. Further, the number is still quite small relative to the aggregate labor force.

lag demand conditions, low nominal wage growth indicates that the economy is below full employment, and high nominal wage growth likely indicates that the labor market is close to full employment. Together, wage growth and prime-age employment rates should provide the FOMC with a good estimate of if the labor market is anywhere close to full employment.

What the Federal Reserve Should Do Now

As of November 2022, the Federal Reserve has quickly raised the overnight rate to 3.75 to 4 percent and has begun quantitative tightening to reduce the size of its balance sheet. Some tightening of monetary policy was appropriate given clear markers of high demand: Nominal GDP is significantly above trend, nominal wage growth has been high, and workers have been changing jobs at very high rates.

Many leading indicators of nominal spending and inflation are slowing. Housing starts have declined steeply, asset prices in speculative tech industries have fallen steeply, job vacancy rates and quit rates have moderated from record highs, and wage growth has begun to slow. Combined with easing gas prices, reversals in commodity prices, normalization in many supply chains, slowing growth in asking rents for housing, and a withdrawal of fiscal stimulus, both the demand- and supply-side contributors to inflation are clearly easing.

Not all these changes will result in lower monthly inflation readings immediately, and year-over-year measures of inflation will likely still be significantly above 3.5 percent for a while. However, if monthly readings are consistent with 3.5 percent annualized inflation or below, the Fed should pause interest rate hikes. If monthly readings of inflation remain above the 3.5 percent annualized target range, and if wage growth and services inflation remain above 5 percent annualized growth, the FOMC may want to consider continued gradual interest rate hikes, but at a much slower pace to minimize the risk of overtightening, as it will take time for the effects of the initial interest rate hikes to fully be realized.

POTENTIAL CRITICISMS AND REPOSSES

1. Why not nominal GDP or labor income targeting?

As mentioned earlier in this brief, average inflation targeting is flawed due to the necessity of make-up policy and the difficulty of precisely engineering changes in inflation. The concern about precision is partially alleviated with nominal GDP targeting: It is much easier to know how monetary policy will affect nominal spending than it is to know how nominal spending will break down into inflation versus real output.

However, the issue of make-up policy remains when using nominal GDP as a policy target. Consider a case such as 2018–2019, where the economy was close to potential GDP, but past nominal growth was weak. Should policymakers have strived to generate extra inflation just to get nominal GDP back to some past trend? And when should the reference period start? Using the 2005–2008 trend as the target, by 2019, nominal GDP would be around 20 percent below target. Potential output was certainly not 20 percent above GDP in 2019, and so returning to the nominal trend would require very high inflation.

Some advocates for nominal GDP targeting may argue that such a policy would not have to deal with averaging if the central bank can achieve constant nominal GDP growth. This is likely impossible, as doing so would require getting inflation to move inversely with real output growth at high frequencies, even in response to demand shocks. Therefore, any nominal GDP target will fundamentally have to deal with averages, which brings back unpleasant options when considering make-up policy.

Recently, Employ America has proposed (Amarnath 2019) a gross labor income floor as a monetary policy framework. In practice, monetary policy that targets an inflation range, sees through supply shocks, and targets employment shortfalls is likely to respond very similarly to a gross labor income floor. Both nominal GDP and gross labor income growth floors may be useful metrics to evaluate the speed of recovery and understanding if demand is sufficiently high even in the context of supply shocks.

2. A point target of inflation expectation is important for long-term nominal contracts. Advocates of an inflation target with a point target (i.e., 2 percent) argue that point targets are helpful for setting expectations and for pricing long-term nominal contracts. There may even be concerns that there are risk premia in these long-term assets if long-term inflation is uncertain. In reality, the costs of leaving a single long-run inflation target seem minimal. The US experienced dynamic growth for many decades without an explicit inflation target. Australia's growth has been quite robust despite have an inflation target range of 2 to 3

percent without an explicit midpoint target. Whatever benefits there are of such precisely stable expectations of long-run inflation are likely outweighed by much more important factors affecting growth and the functioning of the financial system.

3. Changing the inflation target now would risk or destroy the Fed's credibility.

If the Fed raises the tolerable rate of inflation as inflation falls from the current highs, what's to stop the Fed from moving the inflation target again? Why not make the range 3 to 5 percent after the next inflationary episode? The answer here lies in the fact that inflation is severely unpopular. Having inflation regularly in the high single digits or double digits is likely to bring about political backlash that no central banker wishes to provoke, and central banks in leading economies are unlikely to ever tolerate sustained inflation significantly above 4 percent.

4. Inflation is better dealt with using nonmonetary tools.

This brief focuses on what the Fed should do under the expectation that Congress's stance toward inflation and the roles of fiscal and monetary policy will likely be unchanged in the near future. Various other tools to directly affect sector-specific prices or to establish fiscal tools to manage aggregate demand should be explored.

CONCLUSION

The Federal Reserve has a challenging task of maintaining both price stability and maximum employment. The Fed's current target of 2 percent inflation and framework of Flexible Average Inflation Targeting assume too much power of the Fed to precisely engineer inflation, and they generate unnecessary risk that the economy operates well below maximum employment to hit 2 percent inflation.

Instead, the Fed should target a range of inflation from 2 to 3.5 percent, as occasionally having higher demand-driven inflation will be the key indicator that the economy is reaching maximum employment.

As we have experienced during the COVID-19 pandemic, disruptions to supply and swift changes in the composition of consumer demand can generate inflation that monetary policy is poorly equipped to address. This suggests that additional, nonmonetary policies should be developed to ensure the resiliency of supply chains and protect the most vulnerable against sudden changes in the cost of living.

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