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**Working Paper**

## Will a Recovery of Real Wages Obstruct Progress Toward Disinflation?

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# Will a Recovery of Real Wages Obstruct Progress Toward Disinflation?

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## Will a recovery of real wages obstruct progress toward disinflation?

### Abstract

Many observers, including officials at the Federal Reserve, have focused on the need for wages to decelerate if progress toward reducing inflation is to be sustained. We agree that current elevated rates of wage growth would not be consistent with the Fed's 2 percent inflation target in the longer run, and so would eventually need to come down. At the same time, however, real wages have suffered over the past couple of years, suggesting a potential tension between the goals of returning inflation to the Fed's longer-run goal and restoring real wages to their pre-Covid trend. In this note, we use a macroeconomic simulation model to explore different ways in which the gap between real wages and their trend could be resolved and their implications for inflation, unemployment, and interest rates. We find that if both firms and their employees are indifferent to the level of the wage gap, as standard models generally assume, future increases in unemployment and consequent declines in nominal wage gains will lead to declines in inflation but no progress on the wage gap. Conversely, if employees seek to make up for lost wage growth and restore their share of income while firms seek to maintain their current elevated markups, the result is likely to be stagflation: a wage-price spiral and a sharp increase in unemployment. Finally, if elevated markups put downward pressure on prices, disinflation can be achieved along with further solid wage growth that restores wages to their pre-Covid trend. This felicitous outcome would be reinforced if, as evidence suggests, recent price increases reflect to an important degree tight product markets, so that a weakening in aggregate demand leads to rapid disinflation.

May 25, 2023

At present, the single most important influence on the near-term course of the U.S. economy is the course of inflation, which in turn will determine the path of monetary policy chosen by the Federal Reserve. In judging how inflation is likely to evolve going forward, the Fed is closely focused on developments in wages and the labor market. In a November 2022 speech at the Brookings Institution, Federal Reserve Chair Jay Powell noted:

*... the labor market, which is especially important for inflation in core services excluding housing, shows only tentative signs of rebalancing, and wage growth remains well above levels that would be consistent with 2 percent inflation over time. Despite some promising developments, we have a long way to go in restoring price stability. (Powell, 2022)*

More recently, the minutes of the March 2023 FOMC meeting put it this way:

*Participants generally judged that some more easing in labor market tightness and slowing in nominal wage growth would be necessary for sustained disinflation. ... As a source of upside risk to inflation, participants cited the possibility of more-persistent-than-anticipated price pressures, due to, for example, surprisingly resilient labor demand. (FOMC, 2023a)*

The focus on labor markets and wage growth isn't restricted to the Federal Reserve. In a recent editorial, Jason Furman, former head of the Council of Economic Advisors, writes:

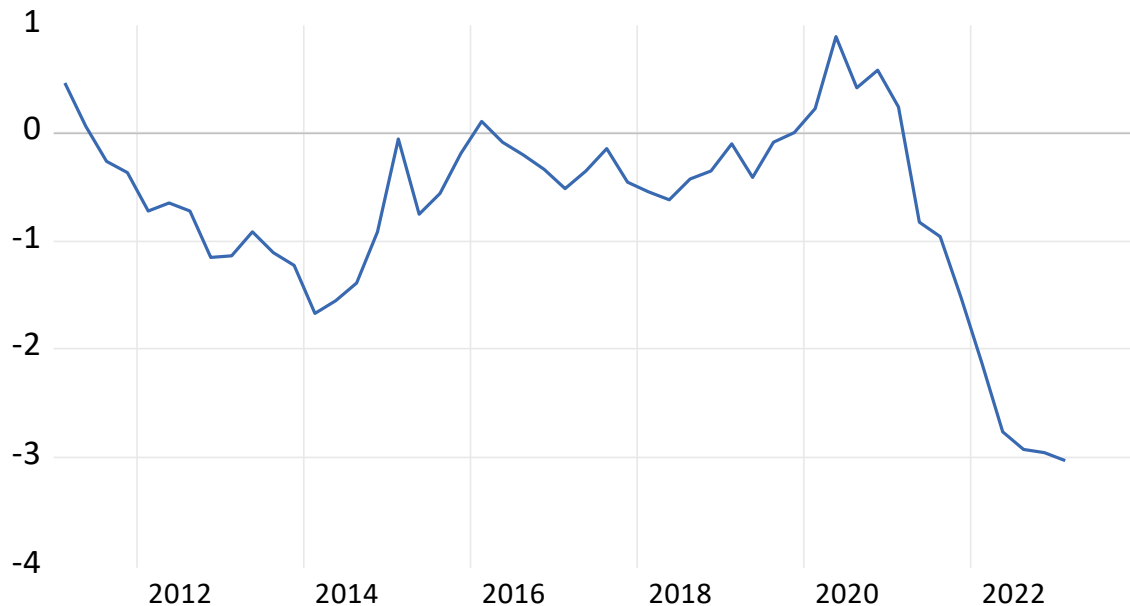
*Fundamentally, much of the economy's underlying inflation had nothing to do with base effects or microchips or timber prices. It's a product of extremely tight labor markets leading to rapid wage gains that passed through as higher prices. These higher prices have also led to faster wage gains. Some call it a "wage-price spiral," but a better term is "wage-price persistence," because inflation stays high even after the demand surge goes away. Wage growth is currently running at an annual rate of about 5%. Sustaining such wage growth with 2% inflation would require a large increase in productivity growth or continually falling profit margins. I'd root for either outcome, but I wouldn't bet on them. (Furman, 2023)*

We agree with Furman that 5 percent wage growth would not be consistent with the Fed's 2 percent inflation target in the longer run, and so would eventually need to come down. At the same time, real wages have suffered over the past couple of years, suggesting a potential tension between the goals of returning inflation to the Fed's longer-run goal and restoring real wages to their pre-Covid trend. In this note, we explore different ways in which this imbalance could be resolved, and their implications for inflation, unemployment, and interest rates.

We focus on the "wage gap," the difference between the level of real wages and their trend value. Figure 1 shows the evolution of one measure of the wage gap over the past twelve years. The gap is assumed to equal zero in 2019:Q4, on the eve of the pandemic (we provide more details shortly). This measure was relatively stable over the 2012 to 2019 period, as well as in the initial pandemic year of 2020. With the outbreak of inflation over the past two years, however, the wage gap has turned starkly negative. As we discuss in more detail below, that's because wages have grown more slowly than would

be implied by their trend relationship with prices. Note that the counterpart of this widening of the wage gap is a decline in labor's share of income or, equivalently, a rise in the markup over costs that firms charge for their products.

Figure 1: The Wage Gap



Depending on how this “wage gap” evolves, there could be very different outcomes for future inflation. In what follows, we develop a model to explore these issues. We use the model to consider various scenarios about how the recent real-wage imbalance will be unwound. We would emphasize several key results:

1. In a setting in which both firms and their employees are indifferent to the level of the wage gap, we find that future increases in unemployment and consequent declines in nominal wage gains will lead to declines in inflation but no progress on the wage gap.
2. If employees seek to narrow the wage gap and restore their share of income while firms seek to maintain their current elevated markups, the result is likely to be stagflation; in our simulations, there is a wage-price spiral as well as a sharp increase in unemployment.
3. If instead we assume that elevated markups put downward pressure on prices—perhaps reflecting heightened competition—disinflation can be achieved along with further solid wage growth. In this case, the wage gap narrows and returns to pre-Covid levels.
4. We find even more sanguine results if we assume that, as suggested by Kamin and Kearns (2022), recent price increases reflect to an important degree tight product markets. In this case, any weakening in aggregate demand could lead to very rapid disinflation.

A key consideration in assessing the plausibility of the various outcomes are views on the likelihood of the wage gap remaining depressed. On the one hand, there has been little tendency for the labor

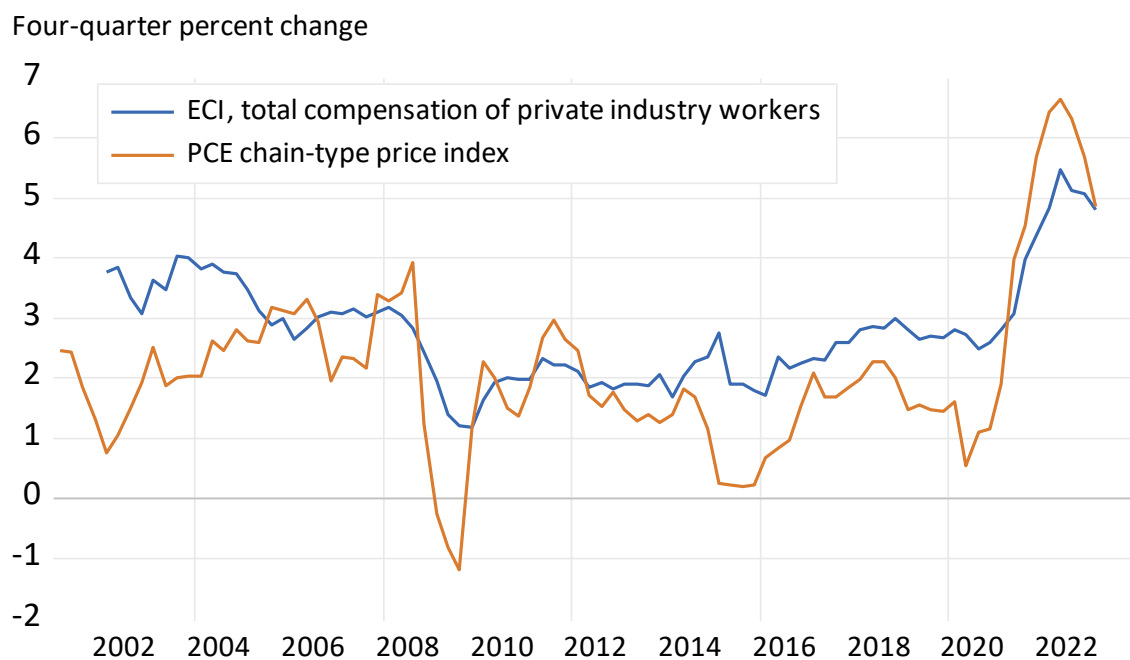
May 25, 2023

share of income to revert in recent decades, suggesting that the current decline could also persist. On the other, a case can be made that the decline in recent decades reflected structural changes associated with globalization and automation, and no analogous shifts are apparent at present. At this point, we feel it's hard to have much conviction on this issue; we will learn a lot as the current episode unfolds.

### The definition of the wage gap

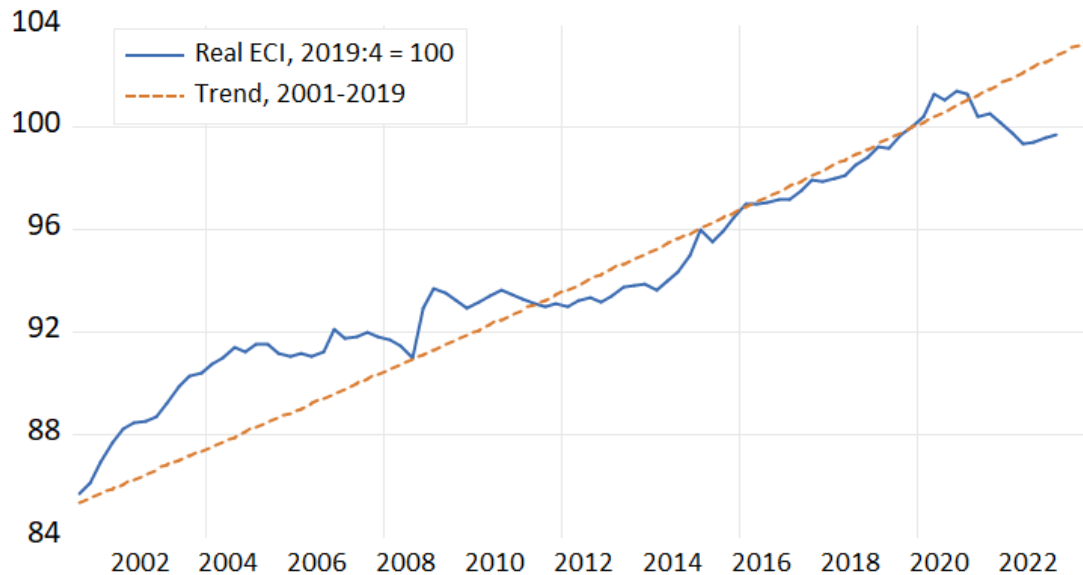
As indicated in Figure 2, for most of the preceding couple of decades, wage growth as measured by the Employment Cost Index (ECI) has exceeded inflation (overall PCE price index). This reflects the fact that wage growth generally includes compensation not only for rising prices but also for rising productivity growth.

Figure 2: Wages and Prices



Accordingly, real wages, the ratio of nominal wages to prices, trend upwards over time, as indicated by the solid blue line in Figure 3:

Figure 3: Real ECI and Trend



The dashed line represents the trend of real wages over the 2001-2019 period, prior to the pandemic—it averaged an increase of 0.9 percent annually. After 2019, real wages rose briefly above trend before dropping below it; as Figure 2 indicates, that’s because wage gains didn’t keep up with price increases. Accordingly, the wage gap, which is the difference between wages and their trend value, rose above zero before declining below zero subsequently, as shown in Figure 1 above.

More formally, the wage gap is defined as:

$$(1) \text{ wagegap}_t = \log \left[ \frac{W_t}{P_t \text{trend}_t} \right] - \mu .$$

where  $W_t$  is the level of wages, which, again, we take to be the ECI for private-sector hourly compensation;  $P_t$  is the level of wages, again the overall PCE price index; and  $\text{trend}_t$  is the trend in the ratio of the ECI and the PCE price index during the 2001-2019 period. Although the trend captures the effects of gains in trend productivity, we do not use the official BLS productivity data to inform this trend as the productivity trend can differ from the trend movement in real wages for purely technical reasons.<sup>1</sup> We extend the trend through 2023. We feel this is an appropriate approach; as Fernald and Li

<sup>1</sup> Among the most important reasons: (1) The ECI is fixed weighted whereas the labor productivity data are affected by changes in industry and occupation shares. (2) The measure of the real wage that would be appropriate to compare with productivity would be measured relative to product prices—the business-sector deflator—rather than consumer prices. (3) The wage measure that is used in the national accounts has a different scope than the ECI; one key difference is that the national accounts measure includes the capital gains on employee stock options whereas the ECI does not. Rather than making (potentially controversial) adjustments for each of these factors, we instead chose to take the simpler and more transparent approach of computing the pre-Covid trend in real (consumer) wages.

(2022) have discussed, there is little to indicate that underlying productivity trends—the main driver of real wage gains—have shifted during the pandemic period.

### Some general models

We begin with general models of wage and price dynamics; they nest the various specific cases that will be the focus of our analysis. For wages, our general model is:

$$(2) \Delta w_t = \Delta trend_t + \gamma_w \Delta \bar{p}_{t-1} + (1 - \gamma_w) ptr_t + \kappa_w (NRU_t - RU_t) - \lambda_w wagegap_t + v_t,$$

where  $\Delta w_t$  is quarterly wage growth,  $\Delta trend_t$  is trend real wage growth,  $\Delta \bar{p}_{t-1}$  is a moving average of past inflation,  $ptr_t$  is a measure of longer-run inflation expectations,  $RU_t$  is the unemployment rate,  $NRU_t$  is the natural rate of unemployment, and  $v_t$  is a (not-serially-correlated) random error term. This model has several key features. It allows past inflation to affect wage growth; it allows for a Phillips-curve effect through the  $\kappa_w (NRU_t - RU_t)$  term; and it allows for the possibility that the wage gap can affect wage gains—in current circumstances, with a negative wage gap, this term would put upward pressure on wage growth.

Our general model for prices is analogous:

$$(3) \Delta p_t = \gamma_p (\Delta \bar{w}_{t-1} - \Delta trend_{t-1}) + (1 - \gamma_p) ptr_t + \kappa_p (NRU_t - RU_t) + \lambda_p wagegap_t + u_t,$$

where  $\Delta \bar{w}_{t-1}$  is a moving average of past wage growth. A key feature is that the wage gap term enters with the opposite sign in this equation as in the wage equation, which captures the notion that a negative wage gap could also represent an elevated price markup, and thus competitive pressures may put downward pressure on price inflation.

The presence of an unemployment gap in a price equation that already includes wages is somewhat unconventional. It captures the idea that firms' desired markups may be procyclical: When aggregate demand is strong, the unemployment rate will be low and firms may seek higher markups in such a high-pressure economy.

An even-more general specification would have allowed for lagged wages in the wage equation and lagged prices in the price equation. We did not include these terms because they don't figure importantly in the subsequent analysis, and to avoid clutter. Also, at least in the wage equation we examine, we found little empirical evidence that such a term was important.

### A model without the wage gap

As noted, these equations are quite general and we use simpler specifications to illustrate key features of the current situation. Initially, we assume that there is no tendency for wage gaps (or markups) to put pressure on wages and prices—that is,  $\lambda_w = 0$  and  $\lambda_p = 0$ . Such a specification is consistent with the stylized fact of the past couple of decades, namely, that labor's share—another manifestation of the wage gap—has not tended to revert to an average value.

As detailed in the Appendix, we have estimated a version of Equation 2, excluding the wage gap term. In our estimation, we find that, over the past 20-plus years, the behavior of wages—specifically,



May 25, 2023

the ECI for private hourly compensation—can be well characterized with  $\lambda_w = 0$ ,  $\gamma_w = 0.41$ , and  $\kappa_w = 0.20$ . (We assume that lagged prices enter as a four-quarter moving average.) Both  $\gamma_w$  and  $\kappa_w$  were strongly statistically significant. We estimated the equation over the period 2001-2022; using a sample of 2001-2019 did not lead to substantially different estimates. Our estimates suggest a statistically significant effect of labor-market slack on wage growth. They also indicate a partial passthrough of price inflation into wage inflation. We view the partial passthrough result as consistent with the recent shortfall in wages relative to price inflation.<sup>2</sup>

We turn next to prices. We note first that in the decades prior to the Covid crisis, there has been little evidence that wages affected prices in U.S. data.<sup>3</sup> At the same time, policymakers have expressed concern that the recent elevated pace of wage gains, if maintained, would not be consistent with inflation at their 2 percent goal. The quote from Jason Furman above makes this point, and one Fed official has noted:

*A potential downside of a tight labor market is if labor costs, which heavily influence inflation, grow so fast that they slow progress toward the FOMC's 2 percent objective. Wages and other measures of compensation accelerated as inflation surged in the second half of 2021 and wage growth remained high in 2022. But as overall inflation has begun to moderate in recent months, so have some measures of growth in wages and other compensation...These are encouraging signs, but we need to see continued improvement across various measures of labor costs, because additional moderation is needed to bring inflation down to our 2 percent goal and because a significant escalation in wage growth could drive up longer-range inflation expectations. (Waller, 2023)*

To reflect this policymaker concern, we initially consider a simple assumption about the effect of wages on prices, namely, that wage inflation, adjusted for productivity gains, is eventually passed into price inflation. We thus assume that  $\gamma_p = 1$  and  $\kappa_p = 0$  as well as  $\lambda_p = 0$ . We assume a simple three-quarter lag distribution; as we will see, when coupled with the empirical wage equation, the implications of this specification turn out to be sensible.

$$(4) \Delta p_t = \frac{1}{3} \sum_{i=1}^3 (\Delta w_{t-i} - \Delta trend_{t-i}) + u_t$$

Although this equation is at variance with the empirical finding, noted above, that wage gains do not predict future price inflation, we believe that finding reflects the low and stable inflation of the pre-Covid decades. While there were fluctuations in wages connected with the business cycle as in our

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<sup>2</sup> Recent IMF analysis suggested that, across a panel of countries, measures of inflation expectations did a better job of explaining wage growth than did lagged inflation (IMF, 2022). We examined this hypothesis; results are presented in the Appendix. We find, based on our U.S. dataset, that lagged prices entered our wage equation more robustly than did measures of (one-year-ahead) inflation expectations. Our analysis differs importantly from theirs (one country, different measure of wages) and those differences could well account for the difference in results. The IMF analysis also suggested that the ratio of vacancies to the unemployment rate may do a better job of explaining wages than an unemployment-rate gap. We were able to confirm that result. However, the differences were not stark and because we will later be integrating this equation into a conventional macroeconomic model where the unemployment rate appears, we chose to focus on the unemployment rate.

<sup>3</sup> See, for example, IMF (2022) and Peneva and Rudd (2017).

May 25, 2023

empirical wage equation, under low and stable inflation, these fluctuations were not expected to persist and so left little mark on prices. We thus think that the lack of sensitivity of prices to wages evident in the two decades prior to 2020 is unlikely to characterize the current episode of high inflation.

When Equations 2 and 3 are combined, there is a mutual dependence between wages and prices. This mutual dependence implies a mild form of wage-price spiral, as wages are affected by prices and prices by wages. That spiral is not self-perpetuating, however, because the (empirically based) wage equation manifests only partial passthrough of wages into prices. As a consequence, this mild form of the spiral does not prevent inflation from eventually declining to the Fed’s objective.

While there is a mutual dependence of wages and prices, with  $\lambda_w$  and  $\lambda_p$  set to zero, there is no economic mechanism that would tend to close the wage gap. Thus, the shocks to the model—for example, the supply shock,  $u_t$ —can have permanent effects on the wage gap. We will shortly consider extensions to the model that allow the wage gap to affect the evolution of inflation.

We now consider an assessment of the implications of this model for the inflation outlook. To do so, we embed the wage and price equations in a large-scale macroeconomic model. We start with the publicly available version of the Fed Board staff’s FRB/US model.<sup>4</sup> We then replace the original model’s equations for wage- and price-setting with the models of wages and prices sketched above. For variables other than wages and prices, we choose conditioning assumptions (add-factors to the model equations) that allow the model equations to replicate the Federal Reserve’s projections at the time of the March 2023 FOMC meeting, as reflected in the Summary of Economic Projections.<sup>5</sup> Thus, if inflation were to follow the projections in the March SEP, the model forecasts would replicate the March 2023 FOMC projections. We adopt this approach because the projections of the FOMC are prominent in discussions of the prospects for monetary policy. They typically do not differ greatly from private-sector forecasts. (See Roberts, 2022, for a comparison of private-sector forecasts and the SEP as of spring 2022.)

For the two key conditioning factors in our model of wages and prices, the natural rate of unemployment ( $NRU_t$ ) and the public’s longer-run inflation expectations ( $ptr_t$ ), we rely on the discussion in Roberts (2023). There, John argues that the Fed’s projections (as reflected in the median values from the SEP) are most consistent with a value of  $ptr_t = 2$  percent and  $NRU_t = 4\frac{1}{2}$  percent. Under these assumptions, longer-run inflation expectations align with the Fed’s inflation target, and the natural rate of unemployment lines up with the increase in the unemployment rate in the Fed’s projections.

Figure 4 shows results; the figure also shows the FOMC’s March 2023 projections. The outlook for inflation from this model is broadly similar to the SEP’s; we take this as confirmation that our

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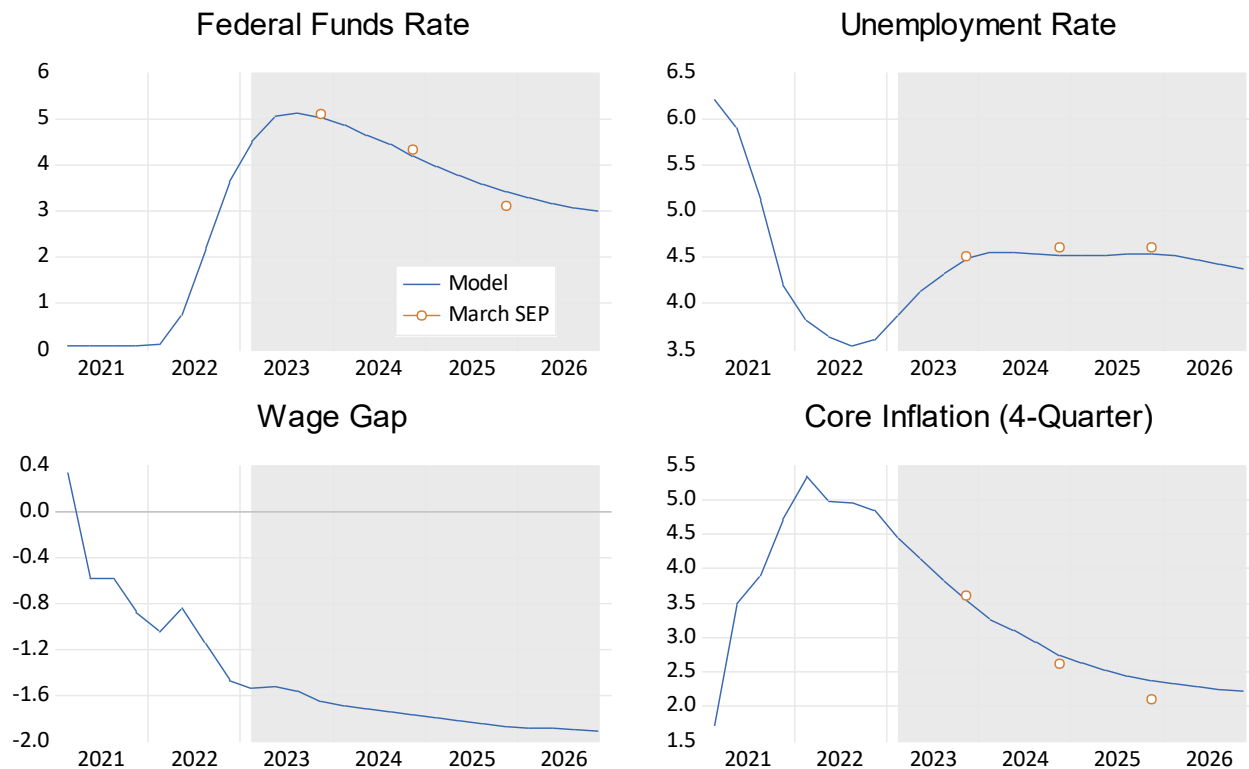
<sup>4</sup> See Federal Reserve (2023) for information about the FRB/US model.

<sup>5</sup> In particular, we use the public FRB/US database posted on the Federal Reserve’s website. With one exception, we use the version of the database that is consistent with data available at the time of the March 2023 FOMC meeting, and with the handful of variables for which there are projections in the SEP. The exception is the set of “safe” interest rates in the model—the federal funds rate and Treasury yields—for which we use information available on the eve of the FOMC meeting.

May 25, 2023

specification is sensible.<sup>6</sup> As can be seen in the bottom-left panel, there is no tendency for the wage gap to close. That shouldn't be surprising, since we assumed that  $\lambda_w$  and  $\lambda_p$  are both equal to zero. We now turn to specifications that allow the wage gap to affect wage and price setting.

Figure 4: SEP and Model Simulation without the Wage Gap



Shading indicates projection period

### Closing the wage gap

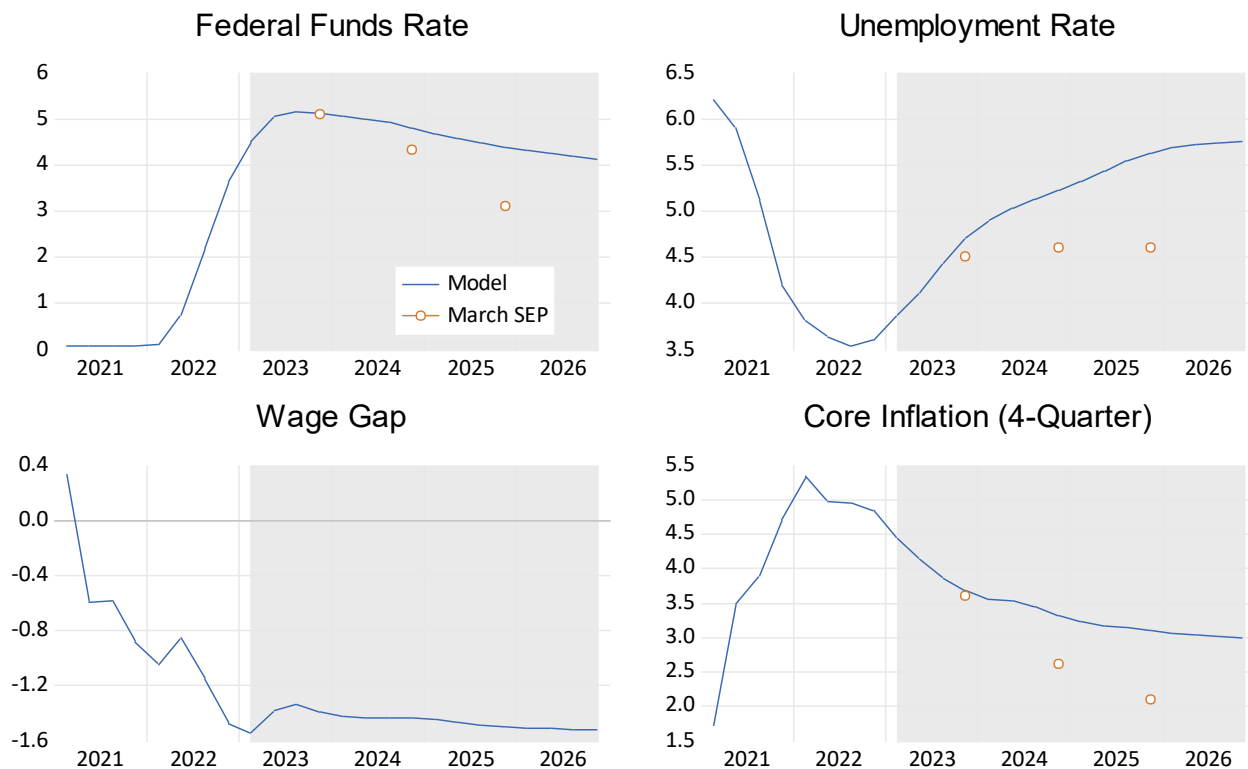
We now allow for the possibility that the wage gap can affect wages and prices by allowing non-zero values for the two wage-gap terms,  $\lambda_w$  and  $\lambda_p$ . Given the instability in labor's share in recent decades noted above, we do not estimate the coefficients on the wage-gap terms,  $\lambda_w$  and  $\lambda_p$ . We consider a value of 0.2 for both  $\lambda_w$  and  $\lambda_p$ , which, other things equal, would imply that the wage gap would close at a rate of 20 percent per quarter. Given the lack of empirical grounding, we view our simulations as merely illustrative of how the economy could evolve if these forces were at work.

<sup>6</sup> As noted above, we assume that a three-quarter moving average of wage growth affects price inflation. We also looked at versions with two- or four-quarter lag specifications; these led to inflation that was either lower or higher than the chosen specification, respectively. We thus view our chosen specification as most consistent, among these three, with the projection in the March 2023 SEP.

Attempts to close the wage gap through wage pressure alone

In Figure 5, we allow the wage gap to put upward pressure on wages—in particular, we set  $\lambda_w = 0.2$ . To isolate the effects of this change, we continue to assume that prices are set according to Equation 4. So, they are unresponsive to wage gaps ( $\lambda_p = 0$ ) and passthrough of labor costs into prices is complete ( $\gamma_p = 0$ ). As might be expected, inflation is higher than in the base case as catch-up pressures boost wage gains, which, given our simple specification, are then passed into prices. Figure 6 compares the path for wage growth in this and the previous scenario. As expected, wage growth is considerably faster in this scenario and, given the simple passthrough assumption for price setting, aligns with the higher price inflation. Inflation next year remains above 3½ percent (again, given the ad hoc nature of our calibration, we would advise against putting significant weight on the specific results). Because inflation is higher, our policy rule calls for higher interest rates, which in turn lead to higher unemployment than otherwise. (As discussed in the Appendix, the policy rule assumed in our simulations is in line with the approach to policy embedded in the Fed’s own forecasts.)

Figure 5: Model Simulation with Wage Gap in Wage Equation Only



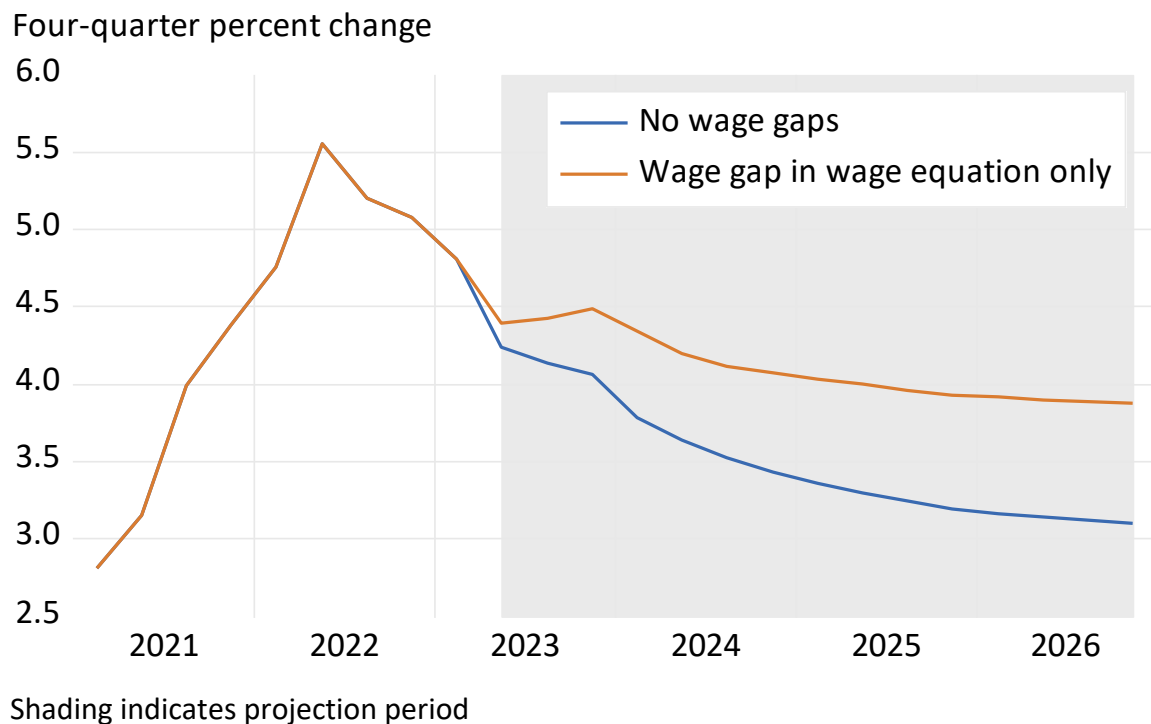
Shading indicates projection period

Perhaps most surprising is the lack of convergence of the wage gap. That’s the result of a tension between wage-setting and price-setting—or between capital and labor, if you will: The presence of the wage gap in the wage equation can be thought of as representing efforts by workers to return the wage gap to its pre-Covid value. At the same time, the assumption of the complete passthrough by firms

May 25, 2023

of growth in labor costs into prices effectively means that price setters are attempting to maintain the inherited wage gap—or, equivalently, the inherited price markup. An upshot of this tension is stagflation, with both the unemployment rate and inflation remaining elevated through the medium term.

Figure 6: Wages, First Two Scenarios

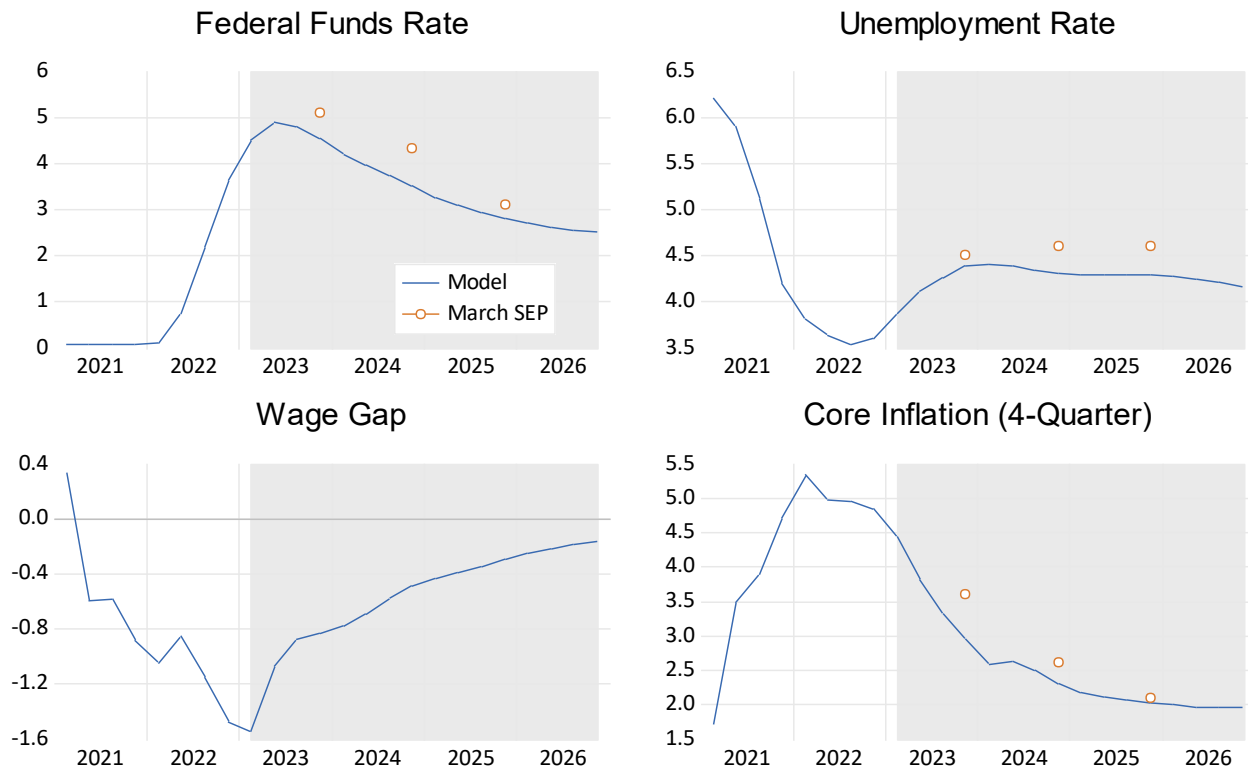


#### Closing the wage gap via both wages and markups

We now allow the wage gap to apply pressure on both wages and prices. Specifically, we set both  $\lambda_w$  and  $\lambda_p$  equal to 0.2. So, not only do negative wage gaps lead to higher wage growth, they also lead to downward price pressure. Figure 7 shows the evolution of the economy in this case.

May 25, 2023

Figure 7: Wage Gap Affects Both Wages and Prices



Shading indicates projection period

In this simulation, core inflation is 2.9 percent this year and 2.3 percent in 2024; it is close to the FOMC's target in 2025. Because inflation is lower than in the baseline, so is the federal funds rate; it is 4.5 percent at the end of this year and 3.5 percent at the end of 2024. Lower interest rates in turn mean that the path for the unemployment rate is lower, by 0.3 percentage point by the end of next year.

One key feature of the simulation in Figure 7 is that the wage gap narrows over time: With the wage gap in both equations, the wage- and price-setting processes share the same view of the ultimate split of income, eliminating the tension between wage-setting and price-setting that led to stagflation in the previous scenario—indeed in this case, inflation comes down faster than in the March SEP. Thus, if both wages and prices are sensitive to the wage gap, closing the gap can be consistent with disinflation that is in line with Federal Reserve objectives.

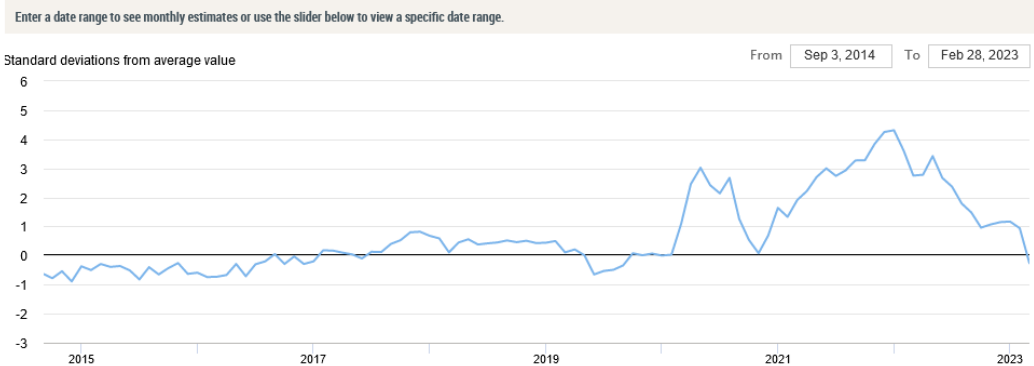
### Demand and markups

So far, we haven't considered how inflation got so high in the first place. As has been widely discussed, in the early stages of the recovery from the pandemic-related lockdowns, supply-chain disruptions were a key factor driving price increases. However, as Figure 8 shows, supply disruptions peaked early last year and have been declining steadily since; the latest reading puts the index at a roughly average level. That suggests that supply conditions are no longer a factor pushing up inflation, although because of the various adjustment lags, the earlier pressures could well still be a net positive.

Figure 8: Index of Supply Disruptions

- The GSCPI's recent movements suggest that global supply chain conditions have returned to normal after experiencing temporary setbacks around the turn of the year.

Latest Update February 2023



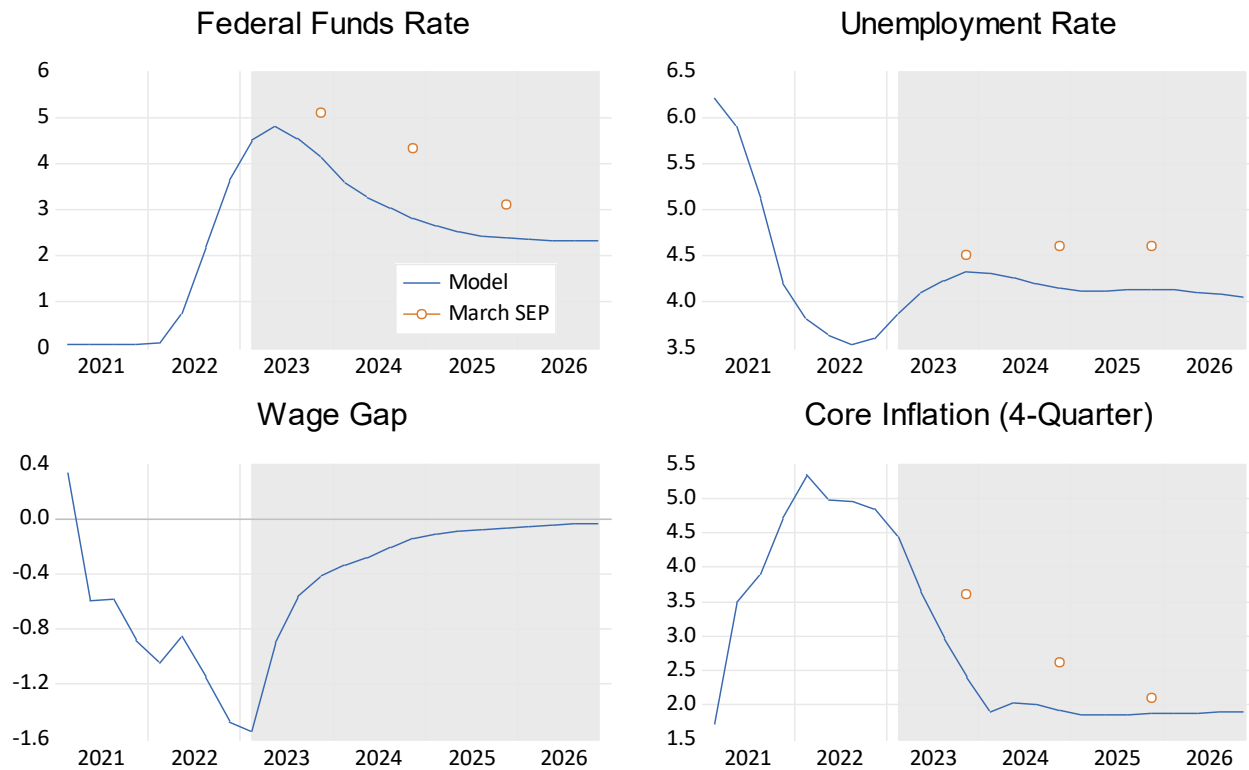
But while lagged effects could account for ongoing effects of the earlier supply shocks on inflation, it's also possible that other factors may be boosting inflation currently. One such factor is the impact of changes in aggregate demand on firms' desired markups. The recent work by Kamin and Kearns (2022) points in the direction of aggregate demand having a direct effect on price inflation, independent of its effect on wages. Looking across countries, they find that where labor markets tightened more since the beginning of the pandemic, as measured by the rise in job openings, core inflation also rose more. They found, however, that there was only a weak relationship between increases in core inflation and wage growth. They concluded that, although job openings are proximately related to the labor market, they were in practice proxying for the general strength of aggregate demand, and thus tight product markets, rather than tight labor markets, were the source of upward pressure on inflation. A more recent paper by Bernanke and Blanchard (2023) also argues that increases in aggregate demand boosted inflation primarily through product prices rather than through wages.

In Figure 9, we allow for the possibility that demand conditions may be boosting firms' desired markups by considering a nonzero value for  $\kappa_p$ , the coefficient linking the unemployment gap to price inflation in Equation 3.<sup>7</sup> We do so by assuming that prices are determined by the same process as that determining wages—thus,  $\gamma_p = 0.43$  and  $\kappa_p = 0.20$ , and  $\lambda_p = 0.2$ . We feel this specification is in the spirit of allowing aggregate demand to affect prices in the same way that it is affecting wages.

<sup>7</sup> Arguably, the effects of aggregate demand on prices might be better captured by an output gap than a labor-market-focused measure such as the unemployment gap. As the well-known Okun's Law relationship suggests, however, these measures are closely linked in practice, and for simplicity, we keep the focus on the unemployment gap.

May 25, 2023

Figure 9: Prices Affected by Unemployment Gap



Shading indicates projection period

The results in Figure 9 suggest that if strong aggregate demand is currently playing a role in pushing up markups, the disinflationary benefits of reducing demand pressures may be even greater than generally thought, with inflation coming down even faster than in the previous scenario, reaching the FOMC's target by next year and similarly sanguine implications for interest rates and unemployment. With aggregate demand now affecting prices as strongly as it affects wages, the wage gap closes quickly with the rise in unemployment.

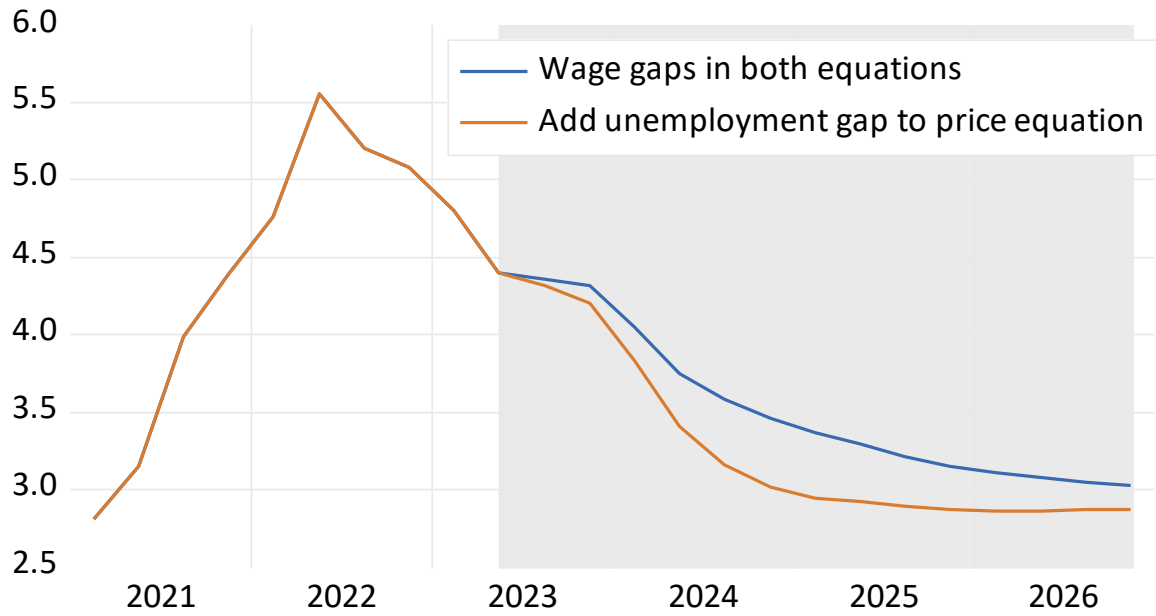
Figure 10 shows the outcomes for wages in the final two scenarios. In both cases, wage growth declines slowly enough to allow a narrowing of the wage gap, but not so slowly as to prevent inflation from falling to the Fed's target.<sup>8</sup>

<sup>8</sup> Gagnon and Rose (2022) also argue for the possibility that future wage growth may exceed price inflation without preventing the Fed's target from being reached.



Figure 10: Wages, Final Two Scenarios

Four-quarter percent change



Shading indicates projection period

## Appendix

### Our assumptions about monetary policy

We assume that monetary policy is set according to a variant of the inertial Taylor rule:

$$rff_t = 0.70 rff_{t-1} + (1 - 0.70)[r^* + \Delta p_t + 0.60(\Delta p_t - \pi^*)],$$

where  $rff_t$  is the federal funds rate,  $r^*$  is the equilibrium real federal funds rate,  $\Delta p_t$  is the rate of price inflation, and  $\pi^*$  is the Federal Reserve's inflation target (2 percent). This setting is similar to that in Roberts (2023); as discussed there, this rule does a good job of characterizing the setting of monetary policy in the FOMC's March 2023 *Summary of Economic Projections*.

This policy rule lacks one key element of a conventional Taylor rule—namely, an influence of the output gap on monetary policy. One reason we leave out this term is that the FOMC has indicated that when the economy is beyond estimates of full employment—as, in the FOMC's projections, is the case currently—they will not put weight on employment deviations (FOMC, 2023b). And, as just noted, this equation does a good job of characterizing the setting of the federal funds rate in the FOMC's recent SEP projections.

### Our estimated wage equation

As noted in the main text, we estimated our baseline wage equation over the period 2001-2022. Column 1 of the table below shows the results we emphasize in the main text. Both lagged prices and the unemployment gap are statistically significant; at the same time, the coefficient on lagged prices is well below a value of one, indicating only partial passthrough of price inflation into wage growth. Columns 2 and 3 consider additional explanatory variables. In Column 2, we add lagged wages; the coefficient is small and not statistically significant. In Column 3, we assess the hypothesis that inflation expectations should enter the equation rather than lagged prices, as suggested in IMF (2022, Chapter 2). We take as our measure of inflation expectations one-year-ahead forecasts from the Survey of Professional Forecasters. The coefficient on this measure of inflation expectations is close to zero and the estimates of the other parameters are little changed. We conclude that over our sample and dataset, the evidence is stronger that lagged inflation, rather than a survey measure of inflation expectations, belongs in a model of U.S. wage determination.

Table A-1. Empirical models of quarterly growth in U.S. nominal wages, 2001-2022

	(1)	(2)	(3)
$\Delta \bar{p}_{t-1} (\gamma_w)$	.430 (.067)	.377 (.081)	.413 (.118)
$RU_t - NRU_t (-\kappa_w)$	-.206 (.055)	-.177 (.060)	-.202 (.060)
$\Delta w_{t-1}$	0 --	.127 (.110)	0 --
$SPF_t$	0 --	0 --	.046 (.260)
SER	.795	.797	.799
R-bar-squared	.486	.485	.480
DW	1.69	1.99	1.69

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