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A LABOR MARKET VIEW ON THE RISKS OF A U.S. HARD LANDING

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### **ABSTRACT**

This paper uses historical labor market data to assess the plausibility that the Federal Reserve can engineer a soft landing for the economy. We first show that the labor market today is significantly tighter than implied by the unemployment rate: the vacancy and quit rates currently experienced in the United States correspond to a degree of labor market tightness previously associated with sub-2 percent unemployment rates. We highlight that the super-tight labor market coincides with current wage inflation of 6.5 percent – the highest level experienced in the past 40 years – and that firm-side slack measures predict further increases in wage inflation over the coming year. Finally, we show that high levels of wage inflation have historically been associated with a substantial risk of a recession over the next one to two years. We argue that periods that historically have been hailed as successful soft landings have little in common with the present moment. Our results suggest a very low likelihood that the Federal Reserve can reduce inflation without causing a significant slowdown in economic activity.

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## 1. Introduction

With inflation accelerating at its fastest rate in four decades and unemployment falling below 4 percent, all indicators today point to an overheating U.S. economy. In response to accelerating inflation, the Federal Reserve moved in March to raise interest rates, and plans for six more rate hikes this year, in the hope that it can achieve a soft landing without pushing the US economy into a recession. The latest projections from the Federal Opening Market Committee (2022), as well as the consensus forecast from the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters (FRBP 2022) supports the soft-landing view: in both forecasts, inflation recedes to below 3 percent and unemployment remains below 4 percent by 2023.

The idea that inflation can fall dramatically without a corresponding rise in labor market slack, however, runs counter to standard economic theory, and is inconsistent with the historical evidence. The original Phillips curve suggests that there is a trade-off between the tightness of the labor market, usually proxied by the aggregate unemployment rate, and inflation. The empirical evidence supports the view that taming accelerating inflation requires a substantial increase in economic slack. **Since 1955, there has never been a quarter with price inflation above 4 percent and unemployment below 5 percent that was not followed by a recession within the next two years.**

In this paper, we focus on evidence from the US labor market to evaluate the plausibility that the Federal Reserve can engineer a soft landing of the economy. We begin by summarizing our earlier work (Domash and Summers 2022) that shows that the labor market today is significantly tighter than implied by the unemployment rate. The number of job vacancies per unemployed is higher than it's been in 70 years (see Figure 1), and worker quits remain significantly elevated, putting additional pressure on nominal wages. We estimate that the unemployment rate that is consistent with the current levels of job vacancies and worker quits is below 2 percent, and that

this measure is more significant for predicting wage inflation than the actual unemployment rate or employment ratio. This suggests that we should currently be thinking about US labor markets as extraordinarily tight.

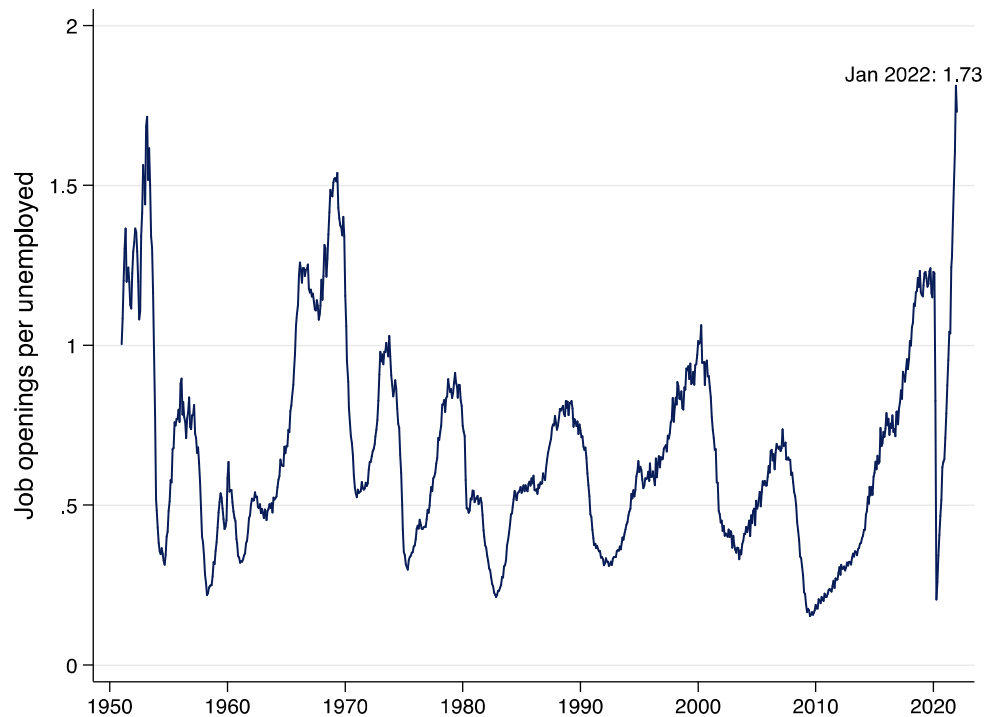


Fig. 1. Historical Vacancy to Unemployment Ratio, Jan 1950 – Jan 2022

Next, we show that this historically tight labor market has coincided with the highest levels of wage growth in the past 40 years. In February 2022, year-over-year wage inflation reached 6.5 percent according to data from the Federal Reserve Bank of Atlanta<sup>1</sup>, the highest on record. Wage inflation has also accelerated at a rapid pace – increasing by nearly 2 percentage points over the last 3 months and nearly 3 percentage points over the last year – and will likely continue to rise through the rest of 2022. Using a wage Phillips curve model with a weighted three-year lagged

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<sup>1</sup> This estimate uses the Atlanta Fed's weighted 3-month moving average of median wage growth. The weighted series is constructed after weighting the sample to be representative of each month's population of wage and salary earners in terms of sex, age, education, industry, and occupation groups (irrespective of whether the person was also employed a year earlier).

inflation to proxy for inflation expectations, we find that the vacancy-to-unemployment ratio predicts wage inflation to surpass 7 percent by the end of the year, and that firm-side unemployment also predicts wage inflation to rise. Such a high level of wage inflation is likely to contribute significantly to underlying price inflation unless productivity rises sharply, or firms cannot pass on cost increases to consumers – both of which are contrary to recent experience. The empirical evidence over the last two decades suggests wage growth and inflation are strongly related: since 2001, the correlation coefficient between wage inflation and price inflation is 0.7.

Finally, we look at the historical evidence from the labor market to assess the likelihood that monetary policy can lower accelerating inflation without substantially increasing economic slack. We show that historically, high levels of wage inflation have been associated with a high risk of a subsequent recession. Since 1955, there has never been a quarter where average wage inflation surpassed 5 percent and the average unemployment rate was below 5 percent that was not followed by a recession over the next two years. There have also only been two periods where wage inflation fell by more than one percentage point in a year – in 1973 and 1982 – and both times coincided with a recession. We show that periods that historically have been hailed as successful soft landings – including 1965, 1984, and 1994 – all had labor markets that were substantially less tight than the present moment. Taken together, the evidence suggests a very low likelihood that the Federal Reserve can reduce inflation without causing a significant slowdown in economic activity and a substantial increase in economic slack.

The rest of this paper is organized as follows: Section 2 summarizes our past work on estimating labor market tightness. Section 3 presents evidence on current levels of wage inflation. Section 4 examines the risks of a US hard landing. Section 5 discusses the policy implications and concludes.

## 2. Estimating labor market tightness

While the aggregate unemployment rate has historically served as a proxy for the tightness of the labor market, there is strong evidence that today's labor market is significantly tighter than implied by the unemployment rate. Since the start of the pandemic, demand-side labor market measures like the vacancy rate and the quits rate have surged to record highs, deviating significantly from their historical relationship with supply-side measures like the unemployment rate and prime-age employment ratio. We illustrate these trends with Beveridge type curves in Figure 2, showing how the relation between firm-side and household-side measures have shifted outwards since the beginning of the pandemic<sup>2</sup>.

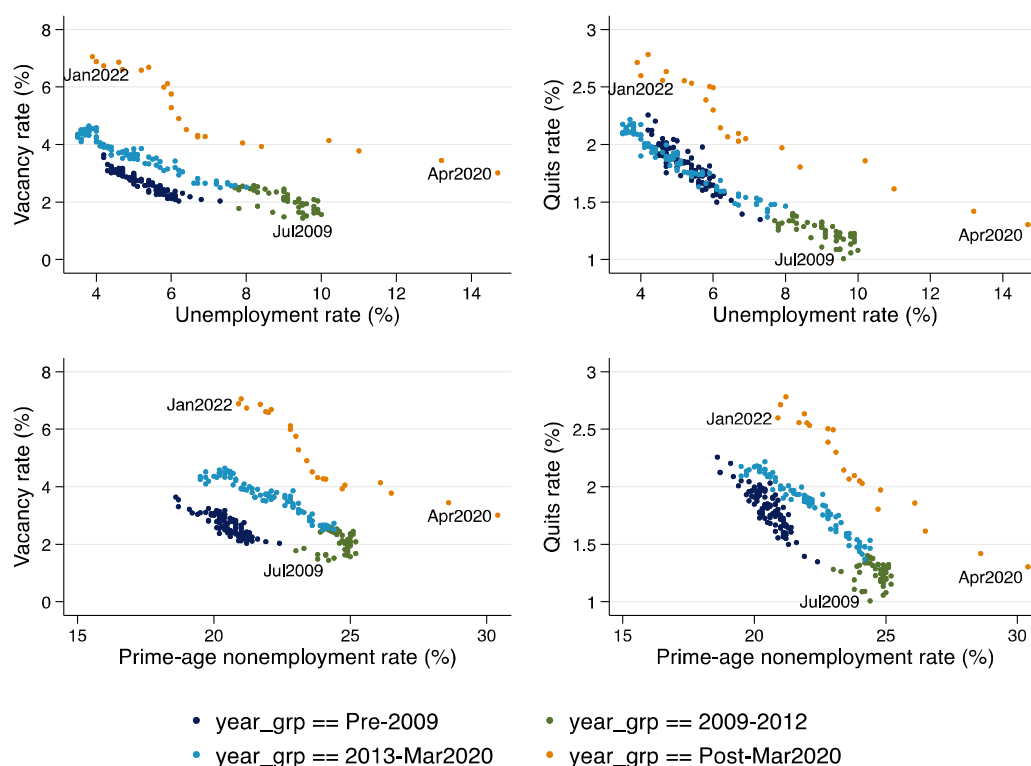


Fig. 2. Firm-side vs household-side slack measures, Jan 2001 – Jan 2022

<sup>2</sup> Data from the BLS Job Openings and Labor Turnover Survey is only available from January 2001 to January 2022. The unemployment rate is the U-3 unemployment rate. Prime-age nonemployment is the share of the civilian noninstitutional population aged 25-54 that is not working. The vacancy rate is the level of job vacancies divided by the size of the civilian labor force, and the quits rate is the level of quits divided by the size of the civilian labor force. All values are seasonally adjusted.

The divergence between the supply-side and demand-side indicators has prompted debate over what measure should be used to assess labor market tightness. Some, such as Federal Reserve Chairman Jerome Powell (2021), have suggested looking at employment indicators like the prime-age employment ratio to gauge labor market slack. Others have found that demand-side indicators like the vacancy-to-unemployment ratio (Barnichon and Shapiro 2022) or the quits rate (Furman and Powell 2021) are most predictive of wage inflation.

In our recent work (Domash and Summers 2022), we use quarterly time series and cross section data between 1990 and 2019 to compare the explanatory power of different slack measures for wage inflation. We compare four different slack indicators – the headline unemployment rate, the prime-age employment ratio, the vacancy rate, and the quits rate – and find that unemployment is a better predictor of wage inflation than the employment ratio, and that the vacancy and quits rate are roughly equivalent to the unemployment rate in explanatory power.

We then estimate a firm-side equivalent unemployment rate by examining what unemployment rate is consistent with the current measures of the job vacancy rate and the quits rate. We regress the unemployment rate on the log of the vacancy rate and the log of the quits rate, using monthly data from the Job Openings and Labor Turnover Survey (JOLTS) from January 2001 to December 2019. We run several different model specifications, including different lag lengths, a time trend, and a structural break in July 2009. In general, all the models fit the data very well from 2001 to 2019, but show a clear break in the relationship after February 2020.

Figure 3 shows the relationship between the actual unemployment rate and the firm-side predicted unemployment rate, using a model with 12-month lags, a time trend, and a structural break. The predicted firm-side unemployment rate in January 2022 was between 1.2 and 1.5 percent.

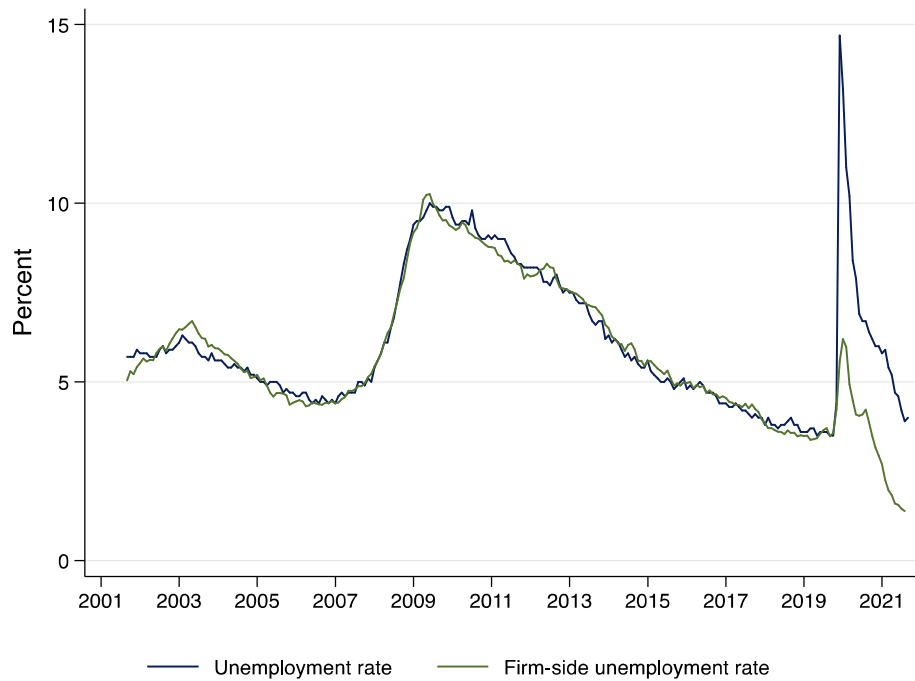


Fig. 3. Actual unemployment rate vs firm-side predicted unemployment rate, Jan 2001 – Jan 2022

To compare the predictive power of the firm-side unemployment rate with the actual unemployment rate for wage inflation, we estimate a wage Phillips curve model that includes the actual unemployment rate and our predicted unemployment rate as the regressors. We find that the firm-side predicted unemployment rate has essentially all the explanatory power in predicting wage inflation over the period 2001 to 2019. These findings are robust across 12 different model specifications that vary the wage series used to calculate nominal wage growth and the lag length of our explanatory variables.

Given the extremely low firm-side predicted unemployment rate today, these results provide strong evidence that the current labor market is substantially tighter than the unemployment rate suggests, and that a given level of unemployment today is likely associated with a significantly more inflationary rate of wage growth than in the past. Rather than using 4 percent unemployment from February 2022 as the basis for labor market tightness, we should currently be thinking about



labor markets as having a degree of tightness that historically corresponded to sub-2 percent unemployment.

### 3. Wage inflation is high and accelerating

The extraordinarily tight labor market conditions outlined above have coincided with rapid increases in wage inflation in recent months. According to the best available wage data from the Federal Reserve Bank of Atlanta, which matches hourly earnings of individuals across 12 months, median wage inflation in February 2022 reached a series high of 6.5 percent (using the weighted 3-month moving average of median wages). Figure 4 shows monthly wage inflation going back to 1997 and shows the historically unprecedented acceleration of wage growth in recent months. Over the last 3 months, wage inflation has increased by 1.9 percentage points, while over the last 12 months, wage inflation has increased by 2.9 percentage points.

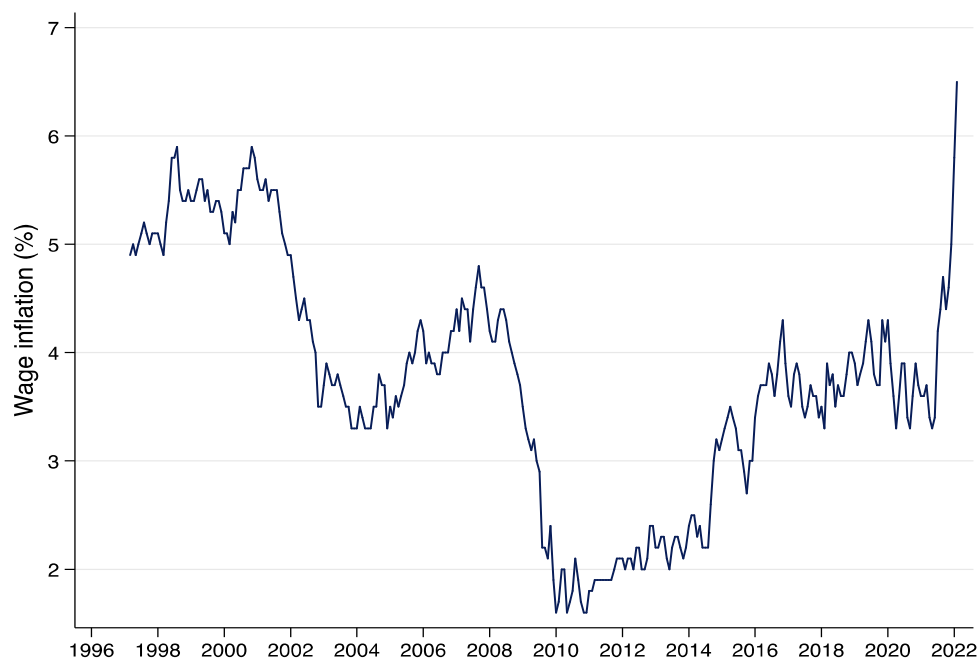


Fig. 4. Median wage growth using data from the Atlanta Fed Wage Tracker, Jan 1997 – Feb 2022

The sharp rise in wage inflation does not reflect our use of wage data from the Atlanta Fed wage tracker rather than alternative wage series. According to the Employment Cost Index for private-sector workers, labor costs increased by an annualized rate of 5.0 percent in the fourth quarter of 2021, up from 2.8 percent in the fourth quarter of 2020. Using the average hourly earnings for all private sector production and nonsupervisory employees from the Bureau of Labor Statistics shows that wage inflation reached 6.6 percent in February 2022. Both series thus depict a similar story of rapid increases in wage growth.

Given the record-level tightness of the labor market, wage inflation is likely to continue to accelerate in the coming year. We simulate wage inflation through the end of the year using a wage Phillips curve model with two alternative slack indicators: the vacancy-to-unemployment ratio and firm-side predicted unemployment. Table 1 presents our predicted wage inflation for December 2022 under several different model specifications. In all our specifications, we use conservative estimates for the trajectory of both labor market slack and price inflation over the coming year to simulate predicted levels of wage inflation. In the models that use the vacancy-to-unemployment ratio as the slack measure, we assume a decline in the number of vacancies per unemployed from the current level of 1.7 to either 1.5 or 1. In the models that use the firm-side unemployment rate, we assume firm-side unemployment remains at its current level of 1.5 percent or increases to 2 percent. Across all or model specifications, we find that wage inflation is likely to continue to increase throughout 2022.

Table 1  
Predicted wage inflation in Dec 2022 under different model assumptions

Slack indicator	Model Assumptions for Dec 2022			Model Predictions		
	V/U ratio	Firm-side unemployment rate	CPI inflation	Predicted wage inflation in March 2022	Predicted wage inflation in Dec 2022	Predicted increase in wage inflation, Mar 2022 – Dec 2022 (pp)
V/U ratio	1.5	#N/A	6.0%	6.5%	7.8%	1.3
V/U ratio	1.5	#N/A	4.5%	6.5%	7.3%	0.8
V/U ratio	1	#N/A	6.0%	6.5%	6.9%	0.4
V/U ratio	1	#N/A	4.5%	6.5%	6.6%	0.1
Firm-side UR	#N/A	1.5	6.0%	5.5%	5.9%	0.4
Firm-side UR	#N/A	1.5	4.5%	5.5%	5.8%	0.3
Firm-side UR	#N/A	2	6.0%	5.5%	5.8%	0.3
Firm-side UR	#N/A	2	4.5%	5.5%	5.7%	0.2

*Notes:* Estimates from a wage Phillips curve model of wage inflation on a 12-month trailing average of the slack indicator and 3-year weighted lagged CPI inflation. The model uses data from Jan 2001 – Present and predicts out-of-sample estimates for wage inflation for December 2022. The assumptions for future slack are conservative estimates: the V/U ratio today is 1.7 and the firm-side predicted unemployment rate is 1.5.

Historically, when wage growth reaches such high levels, inflation tends to accelerate and erodes workers' real wages. Labor costs represent more than two-thirds of all business costs across the economy (BEA 2022), which means that wage inflation contributes significantly to underlying inflation and drastically increases the risk of a wage-price spiral. Using quarterly data going back to 1965, we document how real wages increase with nominal wages up until nominal wage growth reaches about 4.3 percent, and fall thereafter. We show this parabolic relationship in Figure 5, and note that real wages declined by nearly 2 percent in February 2022.

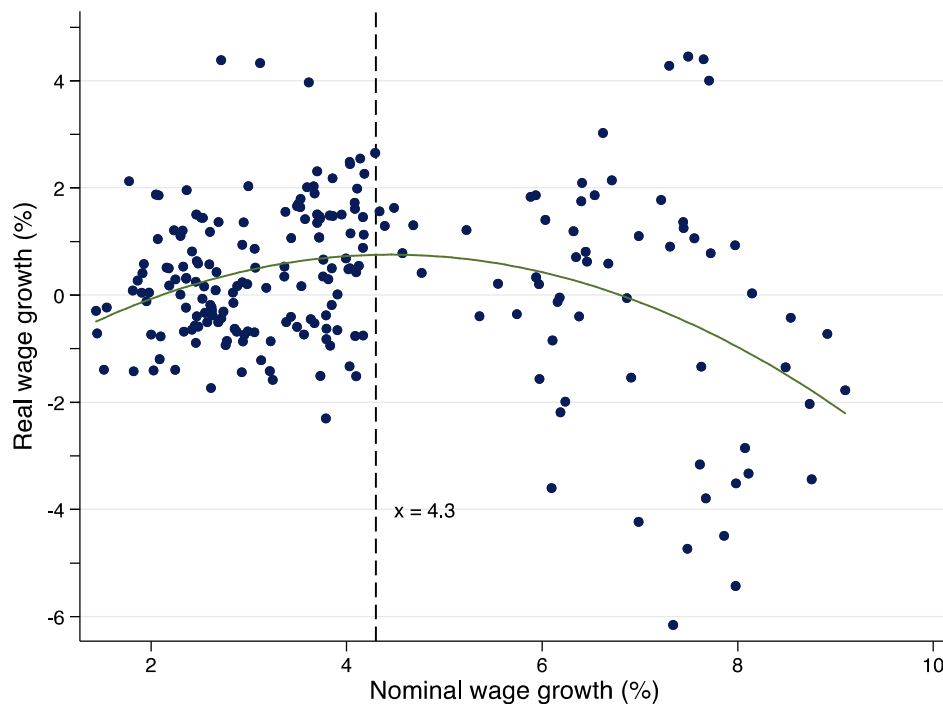


Fig. 5. Real wage growth vs nominal wage growth, 1965q1 – 2019q4

#### 4. Risks of a hard landing

In response to accelerating price and wage inflation, the Federal Reserve moved to hike the federal funds rate by 0.25 percentage points during its March meeting. The FOMC's latest Summary of Economic Projections (2022) projects interest rates to reach 1.9 percent by 2022, and forecasts a soft landing for the economy with inflation coming down and unemployment further declining to 3.5 percent.

Historical evidence from the labor market, however, suggests the likelihood of a soft landing for the economy is very low. To examine the plausibility of the Fed's forecasts, we look at quarterly data going back to the 1950s and calculate the probability that the economy goes into a recession within the next one and two years, conditioning on alternative measures of wage inflation and unemployment. Our analysis is motivated by the fact that overheating conditions like low unemployment and high inflation are usually followed by recessions in the near-term.

Table 2 shows the historical probability of a recession occurring within the next one and two years, conditional on contemporaneous measures of wage inflation and the unemployment rate. The results indicate that lower unemployment and higher wage inflation significantly increase the probability of a subsequent recession. Historically, when average quarterly wage inflation rises above 5 percent, there is about a two-thirds chance of a recession over the next two years. The table also shows that there has never been a quarter with wage inflation higher than 5 percent and unemployment below 5 percent that was not followed by a recession within the next two years.

Measuring labor market tightness with the job vacancy rate, rather than the unemployment rate, yields nearly identical probabilities for the risk of recession over the next one and two years. Using the CPI or Core PCE to measure inflation, rather than using wage inflation, increases the probabilities of recession even further.

Table 2

Historical probability of a recession conditional on different levels of wage inflation and unemployment, using data from 1955-2019

	Avg quarterly wage inflation above:	Avg quarterly UR below:	Prob. Recession over next 4-quarters	Prob. Recession over next 8-quarters	Number of quarters	When did US economy most recently cross threshold?
<b>Wage inflation only</b>	3%	#N/A	28%	51%	110	Q3 2021
	4%	#N/A	33%	55%	67	Q3 2021
	5%	#N/A	37%	66%	41	Q3 2021
<b>Unemployment rate only</b>	#N/A	6%	24%	46%	115	Q2 2021
	#N/A	5%	30%	55%	64	Q4 2021
	#N/A	4%	40%	68%	25	Q1 2022
<b>Wage inflation &amp; unemployment rate</b>	3%	6%	35%	63%	80	Q3 2021
	3%	5%	37%	63%	51	Q4 2021
	3%	4%	44%	65%	23	Q1 2022
	4%	6%	43%	70%	44	Q3 2021
	4%	5%	41%	62%	29	Q4 2021
	4%	4%	33%	60%	15	Q1 2022
	5%	6%	52%	91%	23	Q3 2021
	5%	5%	64%	100%	11	Q4 2021
	5%	4%	50%	100%	8	Q1 2022

Notes: Wage data uses average hourly earnings for all private sector production and non-supervisory employees, Bureau of Labor Statistics

Some have argued that there are grounds for optimism on the basis that soft-ish landings have occurred several times in the postwar period – including in 1965, 1984, and 1994. We note that inflation and labor market tightness in each of these periods have little resemblance to the current moment. Table 3 summarizes the labor market conditions during these alleged soft landings. In all three episodes, the Federal Reserve was operating in an economy with an unemployment rate significantly higher than today, a vacancy-to-unemployment ratio significantly lower than today, and wage inflation still below 4 percent. In these historical examples, the Federal Reserve also raised interest rates well above the inflation rate – unlike today – and explicitly acted early to preempt inflation from spiraling, rather than waiting for inflation to already be excessive. These periods also did not involve major supply shocks such as those currently experienced in the U.S.

Table 3  
Labor market conditions today compared to past periods

	<b>1965</b>	<b>1984</b>	<b>1994</b>	<b>Today</b>
Unemployment rate	4.9%	7.9%	6.6%	3.9%
Vacancy-to-unemployment ratio	0.7	0.5	0.5	1.7
Wage inflation	3.6%	3.8%	2.5%	6.5%
Interest rate > inflation rate?	YES	YES	YES	NO

Note: This table uses quarterly averages from the first quarter of the tightening cycle

Rather than grounds for optimism, the historical experience in the U.S. is that taming rapidly accelerating inflation always leads to substantial increases in economic slack. The only two periods in the postwar period where wage inflation fell by more than one percentage point in a year were in 1973 and 1982 – and both times coincided with a recession. In Table 4, we present estimates for how much slack would be needed in the economy to substantially bring down wage inflation, using the same wage Phillips curve model as the previous section. Each model assumes that wage growth is a function of labor market slack, proxied by the unemployment rate, and inflation expectations, proxied by a 3-year weighted lag of CPI inflation. We assume that price inflation follows the

March FOMC (2022) projections and averages 4.3 percent in 2022, 2.7 percent in 2023, and 2.3 percent in 2024.

Table 4  
Predicted level of unemployment that corresponds to 4.0%, 3.5%, and 3.0% wage inflation by 2024

Wage inflation target 2024	Price inflation 2024	Model implied unemployment rate 2024
4.0%	2.3%	5.4%
3.5%	2.3%	6.9%
3.0%	2.3%	8.4%

*Notes:* Estimates from a wage Phillips curve model of wage inflation on a 12-month trailing average of the unemployment rate and 3-year weighted lagged CPI inflation. Model assumes average 2022 price inflation of 4.3%, average 2023 price inflation of 2.7%, and average 2024 price inflation of 2.3%.

Our models imply that the unemployment rate would need to rise substantially to lower wage inflation to the 3 to 4 percent range over the next 3 years. Taken together, the historical evidence and our model predications suggest a very low likelihood that the Federal Reserve can reduce inflation without a significant corresponding increase in economic slack.

## 5. Discussion and conclusion

The evidence we present in this article suggests that the gravity of the inflation problem facing the Fed is substantial and is unlikely to be resolved without a significant economic slowdown. The current situation is likely even more challenging than historical experiences given record levels of tightness in the labor market. We show that the elevated vacancy and quit rates currently experienced in the U.S. exert significant pressure on wages, and correspond to a degree of labor market tightness previously associated with sub-2 percent unemployment rates. Record levels of structural change associated with the great resignation also imply that the NAIRU has likely

increased, while the Federal Reserve projects additional labor market tightening to 3.5 percent unemployment by the end of the year. Overall, we see no reason to believe that inflationary pressures from the labor market will subside any time soon.

We also highlight that the super-tight labor market coincides with current wage inflation of 6.5 percent, which is the highest level of wage growth experienced in the past 40 years. Wages are also rising at a rapid pace. Historically, when wage growth passes 4.5 percent, inflation tends to accelerate and begins to erode workers' real wages. In February 2022, real wages declined by nearly 2 percent, which is in line with the historical relationship between wage inflation and real wages.

Finally, we show that high levels of wage inflation have historically been associated with a substantial risk of a recession over the next one to two years. Since 1955, there has never been a quarter where average wage inflation was higher than 5 percent and average unemployment was below 5 percent that was not followed by a recession over the next two years. While some have argued that the Fed has successfully engineered soft landings in the past, we note that these periods had significantly lower inflation and higher levels of labor market slack than the current moment. Our results suggest that it is unlikely that we are going to have wage inflation come down with a level consistent with low product price inflation without a significant increase in economic slack.



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