AEA Papers and Proceedings 2023, 113: 110–113
https://doi.org/10.1257/pandp.20231007

The Wage Phillips Curve under Labor Market Power†

By Anastasia Burya, Rui Mano, Yannick Timmer, and Anke Weber*

The period of extremely accommodative monetary policy following the global financial crisis was associated with a strong decline in unemployment while wages remained stagnant until late in the expansion period. These developments led to a growing debate about the flattening of the Phillips curve and its underlying causes (Galí and Gambetti 2019).

While the literature has focused on the role of labor market rigidities (Costain, Nakov, and Petit 2022) and better-anchored inflation expectations (Hazell et al. 2022), the importance of labor market power in shaping these macroeconomic outcomes is less well understood. US firms are well known for not only their product market power but also their significant labor market power, allowing them to mark down wages from the marginal product of labor.

To shed light on potential linkages between labor market power and the trade-off between unemployment and wages, this paper uses a highly disaggregated dataset of 250 million online vacancy postings in the United States from Lightcast (formerly Burning Glass Technologies). Labor market power is measured by the Herfindahl-Hirschman index (HHI) of vacancies in a commuting zone and is found to be more prevalent in less densely populated rural areas, where average incomes tend to be lower and job seekers have fewer employers to choose from. We estimate the Phillips curve at the commuting zone level and exploit regional variation in the degree of labor market power.

*Burya: Columbia University (email: ab4533@columbia.edu); Mano: International Monetary Fund (email: rmano@imf.org); Timmer: Federal Reserve Board (email: yannick.timmer@frb.gov); Weber: International Monetary Fund (email: aweber@imf.org). The views expressed in this paper are those of the authors and do not necessarily represent those of the IMF or the Federal Reserve or their policies.

†Go to https://doi.org/10.1257/pandp.20231007 to visit the article page for additional materials and author disclosure statement(s).

The relationship between unemployment and wage inflation is found to be very weak across regions with high labor market power. These empirical findings are consistent with a dynamic monopsony search-and-matching model where firms can increase hiring by either offering higher wages or posting more vacancies (Manning 2006). Hence, in regions where firms have a large degree of labor market power, they face less competition and can hire workers without having to raise wages as much, which weakens the relationship between employment and changes in wages and therefore leads to a flatter wage Phillips curve.

Using these insights, we conclude by laying out potential implications, particularly on income polarization, of the ongoing monetary policy tightening of the Federal Reserve in light of the existing pattern of labor market power across US regions.

I. Using Vacancies Data to Estimate Labor Market Power

A. *Vacancies Data from Lightcast*

Lightcast tracks online postings covering about 70 percent of all US vacancies. It scrapes over 45,000 online job boards and performs basic data cleaning—for example, by removing duplicates. The resulting dataset comprises approximately 250 million job vacancy postings for the years 2007 and 2010–2019. Hershbein and Kahn (2018) indicate that despite some shortcomings, Lightcast data track aggregate and industry trends closely.

The granularity of Lightcast data allows us to construct an establishment-level dataset. All postings include the date when the vacancy was posted online, the name of the employer, and the Federal Information Processing Standard county code. For our analysis, we aggregate firm-level data at the commuting zone level, since the latter is widely used as a representation of US local labor markets.

B. *Defining Labor Market Power*

We proxy for the extent of labor market power by computing the HHI of vacancy postings at the commuting zone level across all firms:[1]

$$\text{HHI}_{c,t} = \sum_i \text{Vacancy Share}^2_{i,c,t}, \tag{1}$$

where the share of vacancies of every firm i within each commuting zone c is computed cumulatively up to quarter t to avoid dropping smaller firms that post only infrequently and to abstract from quarter-to-quarter noise. Cumulative vacancy shares are more closely related to employment shares. We find that these measured vacancy shares are negatively related to posted wages at the vacancy level even after controlling for a large set of observed and unobserved vacancy, firm, and region characteristics. This finding suggests that vacancy shares are a good proxy for labor market power.

C. *Stylized Facts on Labor Market Power*

Regions with high labor market power as measured by vacancy HHI tend to be less advantaged (have lower gross domestic product per capita, lower house prices, a smaller labor force, and looser labor markets). This result also becomes apparent when we plot the distribution of the average HHI for each commuting zone on a map of the United States (Figure 1). Note that high labor market power is more concentrated in rural, middle-of-the-country areas and is notably absent in the coasts or around larger cities.

Firms that control a significant share of vacancies at the commuting zone level are particularly prevalent in health care, educational services, agriculture, public administration, retail trade, and mining.

II. Regional Wage Phillips Curve

To shed more light on whether labor market power can be at least partly responsible for the flattening of the wage Phillips curve, we estimate the wage Phillips curve at the commuting zone level. Using wage growth data from Lightcast and unemployment data from the Bureau of Labor Statistics, we estimate the following equation:

$$\begin{aligned}\Delta\text{Wage}_{c,t} = {} & \alpha + \beta_1 \text{UR}_{c,t} + \beta_2\, \mathbf{1}\text{LMP}_{c,t} \\ & + \beta_3 \text{UR}_{c,t} \times \mathbf{1}\text{LMP}_{c,t} \\ & + \text{fixed effects} + \epsilon_{c,t},\end{aligned} \tag{2}$$

where $\Delta\text{Wage}_{c,t}$ is the annual wage growth of posted vacancies from Lightcast at the commuting zone–year level. To identify the effect of labor market power on the slope of the Phillips curve, we focus on the interaction between the unemployment rate and a dummy, $\mathbf{1}\text{LMP}_{c,t}$, which takes the value of one if a given commuting zone has above-median HHI. Unemployment $\text{Rate}_{c,t}$ is the unemployment rate at the commuting zone–year level.

The results are shown in Table 1, which presents the estimates of equation (2) with varying levels of fixed effects included. The coefficient β_1 reflects the wage Phillips curve for regions where labor market power is low. The coefficient is always negative and statistically significant, ranging widely from negative 1.5 to negative 5.3 depending on the level of fixed effects introduced. The change in this point estimate as fixed effects are added indicates that commuting zone and time-specific factors that are correlated with

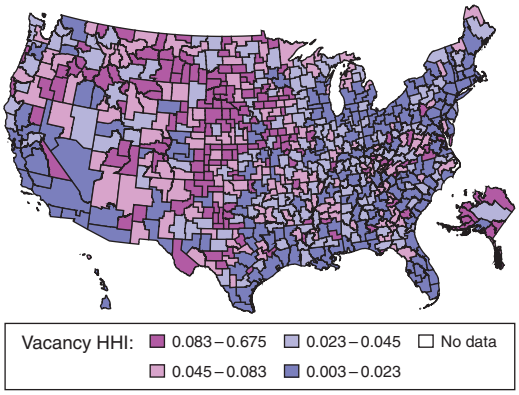

FIGURE 1. GEOGRAPHY OF LABOR MARKET POWER

Note: The map reports labor market power across the United States as measured by the HHI of vacancies in a commuting zone.

[1] See Azar et al. (2020) for more on using the HHI. Such a proxy is theoretically justified by two strands of the literature: in oligopsonistic settings, see Berger, Herkenhoff, and Mongey (2022); in search-and-matching models, see Jarosch, Nimczik, and Sorkin (2019).

Table 1—Wage Phillips Curve Depending on Extent of Regional Labor Market Power

	Wage Growth$_{c,t}$			
	(1)	(2)	(3)	(4)
Unemployment Rate$_{c,t}$	−1.546	−1.735	−2.745	−5.301
	(0.291)	(0.391)	(0.394)	(0.811)
$\mathbf{1}$LMP$_{c,t}$	−0.090	−0.091	−0.078	−0.102
	(0.031)	(0.031)	(0.052)	(0.050)
Unemployment Rate$_{c,t}$ × $\mathbf{1}$LMP$_{c,t}$	1.840	1.619	2.810	2.485
	(0.529)	(0.529)	(0.747)	(0.728)
Observations	6,333	6,333	6,333	6,333
Time fixed effects		✓		✓
Commuting zone fixed effects			✓	✓

Notes: This table reports estimates of a regression of annual wage growth of posted vacancies from Lightcast on the unemployment rate from BLS at the commuting zone–year level and a dummy that is equal to one if the commuting zone has a vacancy-based HHI above the median. Standard errors in parentheses are clustered at the commuting zone level.

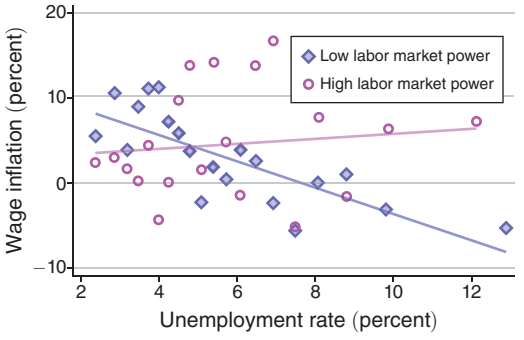

Figure 2. Wage Phillips Curve by Labor Market Power

Notes: This figure plots a binscatter between wage growth and the unemployment rate at the commuting zone–year level. The y-axis refers to annual wage growth from Lightcast data on vacancy postings. The x-axis measures the commuting zone unemployment rate based on BLS data. The blue (pink) diamonds (dots) reflect regions in which labor market power (as measured by the commuting zone–year level HHI in vacancy postings) is below (above) the median.

the unemployment rate are important to control for when attempting to interpret the wage Phillips curve causally. For instance, inflation expectations are likely to be captured by the time fixed effects (Hazell et al. 2022), which may bias the coefficient. The coefficient on the interaction between labor market power and the unemployment rate is positive and statistically significant, leading to an entirely flat or flatter (depending on the specification) wage Phillips curve when there is high labor market power.

Figure 2 confirms the result graphically in a binned scatter plot. For commuting zones that have a below-median HHI in terms of vacancy postings, labeled as *Low Labor Market Power* by the blue diamonds, the wage Phillips curve is steep—that is, there is a strong negative relationship between the unemployment rate at the commuting zone level and wage growth based on Lightcast data. However, for commuting zones with *High Labor Market Power*—that is, where the HHI of vacancy postings is above the median (denoted by the pink dots)—there is no association between the unemployment rate and wage growth.

These results have important implications for the role of monetary policy in stimulating wage and employment growth. In particular, the flatter wage Phillips curve can serve as an explanation for why accommodative monetary policy in the presence of labor market power can significantly stimulate labor demand but does not lead to a strong increase in wages. In fact, using firm-level variation in the degree of labor market power and the response of vacancy postings as well as firm-level employment, we show in Burya et al. (2022) that monetary policy has strong effects on vacancy postings that also translate into stronger employment growth for firms with labor market power, but there is no differential effect of monetary policy shock transmission to wages depending on the degree of labor market power of the firms. We also formalize these insights in a model in which companies with a large degree of labor market power can hire more workers without increasing wages.

III. Discussion

Elevated inflation in the United States is prompting the Federal Reserve to raise rates at the fastest pace in more than 40 years. The findings in this paper have implications for our understanding of how the rapid tightening of monetary policy will transmit to the labor market. They particularly shed light on the role of US corporate concentration in monetary policy transmission.

Historically, small increases in the unemployment rate have reduced wage and price pressures significantly, but there is evidence that this relationship has weakened. Our findings point to an important role of labor market power in explaining this weakening. Reducing wage and price pressures may thus be more difficult when employers have labor market power, as unemployment will have to rise more than it would otherwise, meaning that labor market power increases the sacrifice ratio between inflation and unemployment.

Since regions where labor market power is more prevalent tend to be poorer to begin with, rising interest rates may push unemployment up precisely where incomes are lowest and may disproportionately affect less educated workers. This mechanism could thus exacerbate income polarization within and across regions as the Fed raises interest rates, with significant social and political implications.

REFERENCES

Azar, José, Ioana Marinescu, Marshall Steinbaum, and Bledi Taska. 2020. "Concentration in US Labor Markets: Evidence from Online Vacancy Data." *Labour Economics* 66: 101886.

Berger, David, Kyle Herkenhoff, and Simon Mongey. 2022. "Labor Market Power." *American Economic Review* 112 (4): 1147–93.

Burya, Anastasia, Rui C. Mano, Yannick Timmer, and Anke Weber. 2022. "Monetary Policy under Labor Market Power." IMF Working Paper 2022/128.

Costain, James, Anton Nakov, and Borja Petit. 2022. "Flattening of the Phillips Curve with State-Dependent Prices and Wages." *Economic Journal* 132: 546–81.

Galí, Jordi, and Luca Gambetti. 2019. "Has the US Wage Phillips Curve Flattened? A Semi-structural Exploration." NBER Working Paper 25476.

Hazell, Jonathon, Juan Herreño, Emi Nakamura, and Jón Steinsson. 2022. "The Slope of the Phillips Curve: Evidence from U.S. States." *Quarterly Journal of Economics* 137 (3): 1299–334.

Hershbein, Brad, and Lisa B. Kahn. 2018. "Do Recessions Accelerate Routine-Biased Technological Change? Evidence from Vacancy Postings." *American Economic Review* 108 (7): 1737–72.

Jarosch, Gregor, Jan Sebastian Nimczik, and Isaac Sorkin. 2019. "Granular Search, Market Structure, and Wages." NBER Working Paper 26239.

Manning, Alan. 2006. "A Generalised Model of Monopsony." *Economic Journal* 116: 84–100.