

DISCUSSION PAPER SERIES

IZA DP No. 15385

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Wage-Growth Pressures**

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ABSTRACT

The Shift to Remote Work Lessens Wage-Growth Pressures*

The recent shift to remote work raised the amenity value of employment. As compensation adjusts to share the amenity-value gains with employers, wage-growth pressures moderate. We find empirical support for this mechanism in the wage-setting behavior of U.S. employers, and we develop novel survey data to quantify its force. Our data imply a cumulative wage-growth moderation of 2.0 percentage points over two years. This moderation offsets more than half the real-wage catchup effect that Blanchard (2022) highlights in his analysis of near-term inflation pressures. The amenity-values gains associated with the recent rise of remote work also lower labor's share of national income by 1.1 percentage points. In addition, the "unexpected compression" of wages since early 2020 (Autor and Dube, 2022) is partly explained by the same amenity-value effect, which operates differentially across the earnings distribution.

JEL Classification: J3, E31, D22, E24, E25

Keywords: remote work, amenity value, wage growth, inflation dynamics, recession risk, business expectations, labor's share of national income, wage compression

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The recent inflation surge caught many businesses and policy makers flat-footed. U.S. consumer prices rose 8.6 percent over the 12 months ending May 2022, a jump of several percentage points relative to previous years. Nominal wage growth failed to keep pace. After adjusting for CPI inflation, *real* average hourly earnings in the U.S. private sector fell 3.0 percent over the 12-month period ending May 2022.¹

These facts are not lost on economists. Blanchard (2022), for example, argues that pressures for a “catchup” in real wages will make it harder for monetary policy makers to engineer a soft landing that – without triggering a recession – brings inflation down to acceptable levels. The argument runs as follows: Workers, having experienced a material drop in purchasing power, will bargain for a bigger boost in wages to make them whole. Employers will accommodate the desire for wage catchup, especially when faced with tight labor markets. In effect, the surprise component of recent price inflation raises future wage inflation. Higher wage inflation, in turn, raises production costs and thereby feeds into higher price inflation. Thus, a bigger wage-catchup effect implies the need for tighter monetary policy to bring the inflation rate down to a desired level, raising the likelihood of recession in the process.

Blanchard also sets forth other reasons to worry about inflationary pressures and the challenges of executing a soft landing. In part, his essay is a response to Reifschneider and Wilcox (2022), who advance a more optimistic view about the U.S. inflation outlook and the prospects for a soft landing. Both pieces offer a broader treatment of near-term inflation forces than do we. Our contribution is to draw attention to the amenity value of the recent shift to remote work, explain why it moderates wage-growth pressures, and develop novel survey evidence that lets us quantify the extent of moderation. We also explain how the amenity-value shock associated with the rise of remote work reduces labor’s share of national income and compresses the wage distribution.

1. A Modified Wage-Catchup Argument

We are sympathetic to Blanchard’s wage-catchup argument, but we think its application to current circumstances requires attention to the recent rise of remote work. To see why, start by

¹ We use seasonally adjusted data for the Consumer Price Index for All Urban Consumers (CPIAUCSL_PC1) and Average Hourly Earnings of All Employees in the Private Sector (CES0500000003_PC1) to measure price and wage inflation, respectively, both downloaded from FRED on 10 June 2022.

observing that remote work saves on commuting and grooming time. Barrero, Bloom and Davis (2021b) estimate that the rise of remote work yields aggregate time savings equal to 2 percent of pre-pandemic work hours.² Other employee benefits of remote work include more flexibility in time use over the day, greater personal autonomy, and less traffic-related stress.³ Indeed, when Barrero, Bloom and Davis (2021b) combine employer plans for remote work in the post-pandemic economy with workers' willingness to pay for the option to work from home 2-3 days a week, they find large worker gains associated with the rise of remote work. These gains range from 1.5% of earnings at the low end of the earnings distribution to 7.3% at the high end.

In light of these observations, we modify the wage-catchup argument to include additional elements, as follows: In equilibrium, workers and employers share the amenity-value gains arising from the shift to remote work. Since workers reap the direct benefits of the shift at any given wage, employer benefits take the form of wage-growth restraint during the transition to a new equilibrium with compensation packages that reflect the greater amenity value of higher remote work levels.⁴ The Nash bargaining benchmark, for example, says employers get half the surplus created by the rise of remote work.

In practice, adjustments to compensation packages lag the transition to higher levels of remote work. This is so for multiple reasons. First, the pandemic-induced shift to remote work happened with extreme abruptness in spring 2020.⁵ The shift was entirely unpredicted as late as January or February 2020. Second, many business leaders and economists – perhaps the vast majority – initially saw the pandemic-induced shift to remote work as a transitory development, one that would largely reverse once effective vaccines against the SARS-COV-2 virus became widely available. So long as remote work was seen as a transitory phenomenon, there was little compulsion to adjust compensation packages. The matter would resolve itself. Or so it seemed

² They obtain micro data on time savings and employer plans from the [Survey of Working Arrangements and Attitudes](#). The 2 percent time-savings figure is computed on an earnings-weighted basis and drawn from the update to Barrero, Bloom and Davis (2021b) in Davis (2022).

³ See Mas and Pallais (2017), Angelici and Profeta (2020), Bergeaud et al. (2022) and Vaitilingam (2022).

⁴ Employers benefit in other ways, too. For example, Barrero, Bloom and Davis (2020b) find that workers allocate about 40% of their savings on commuting time to their primary job. Barrero, Bloom and Davis (2021b) provide evidence that pandemic-induced experimentation with remote work yielded new information about which work tasks could be performed more efficiently at home. In turn, that new information led to a productivity-enhancing re-optimization of working arrangements.

⁵ See Barrero, Bloom and Davis (2020a), Bick, Blanden and Mertens (2021), and Brynjolfsson et al. (2020).

until the enduring nature of the shift became evident.⁶ Third, wages and other aspects of compensation adjust sluggishly to changes in economic conditions, an observation that underlies much of macroeconomics and leading models of inflation dynamics. There is no reason to think that compensation adjusts any more rapidly to an abrupt shift in working arrangements than to myriad other shocks. Hence, any wage-growth restraint associated with the shift to remote work will lag the shift itself and unfold over an extended period of time.

2. Does the Shift to Remote Work Restrain Wage Growth?

The modified wage-catchup argument raises two empirical questions: First, does the posited mechanism actually operate in the wage-setting behavior of firms? Second, if so, how much wage-growth restraint does it yield in the transition to higher levels of remote work and new compensation packages? To address these questions, we turn to the [Survey of Business Uncertainty](#) (SBU), which goes each month to hundreds of business executives at a broad cross section of U.S. firms.⁷ We crafted new SBU questions to address the key elements of the modified wage-catchup argument, and we fielded them in the April and May 2022 survey waves.

As a preliminary, we investigate how SBU measures of wage growth and wage expectations compare to similar measures derived from other authoritative sources. Specifically, we ask business executives in the SBU about the average growth rate of wages at their firms over the past 12 months *and* about expectations for average wage growth at their firms over the next 12 months. Table 1 summarizes the results and makes comparisons to other sources.

The activity-weighted mean wage growth rate over the past 12 months in the SBU is 5.4 percent, very similar to estimates from other sources. The modal firm-level response is 5 percent (17.2 percent of firms), and the distribution is skewed to the upside (14.4 percent of firms report wage growth of 10 percent or more). Interestingly, 12.7 percent of firms report zero wage growth in the past year, pointing to the presence of (firm-level) nominal wage rigidity.

⁶ Perceptions about the future extent of remote work continue to adjust as of spring 2022. According to data from the [Survey of Working Arrangements and Attitudes](#), employer plans for the extent of working from home in the post-pandemic economy have drifted steadily upward since January 2021. See Barrero, Bloom and Davis (2021b) and the monthly updates at www.WFHresearch.com.

⁷ See Altig et al. (2021) for an extended discussion and analysis of the SBU.

Table 1: Measures of Nominal Wage Growth and Wage-Growth Expectations
Realized 12-month growth rates

	12-month percent change through:	
FRBA SBU survey (Apr 11-22, May 9-20)	5.4	April/May-22
Avg. Hourly Earnings (total private)	5.2	May-22
Avg. Hourly Earnings (priv., prod. & nonsup.)	6.5	May-22
Atlanta Fed Wage Growth Tracker (smoothed)	6.1	May-22
Employment Cost Index (priv. industry workers)	4.7	2022:Q1

Expected 12-month ahead growth rates

	12-month percent change through:	
FRBA SBU survey (Apr 11-22, May 9-20)	4.9	April/May-22
BIE Special question (January)	7.9 (med = 5)	Jan-22
NABE Outlook Survey (Nonfarm. Bus. comp/hr, annual)*	5.0	May-22
Conference Board (salary budgets)	3.9	Nov-21
FRBNY SCE (median HH earnings)	3.0	Apr-22
FRB Philadelphia Mfg. Survey (wages + benefits)	5.0	May-22

*Notes: All SBU statistics are activity-weighted means, using firm size as the activity measure. The Atlanta Fed's BIE Survey is weighted by industry's share of real output. The NABE Outlook Survey elicits annual projections for nonfarm business compensation per hour. The median is reported. To align this measure closer to a 12-month ahead forecast, we compute an annualized growth rate over the second half of 2022 and the first half of 2023. There are fewer survey-based estimates of expected wage growth as most surveys (NFIB, FRB regional, etc) elicit qualitative measures and compute diffusion indexes.

Looking ahead 12 months from April and May 2022, SBU panel members expect an activity-weighted mean wage growth rate of 4.9 percent. The distribution of anticipated wage growth rates is tighter and less skewed than the distribution of realized growth rates but still centered on a modal value of 5 percent (one quarter of respondents). Few other sources provide quantitative, forward-looking information about firm-level wage growth. Instead, most other surveys on the topic recover qualitative, directional measures of anticipated wage growth. That said, our statistics for wage-growth expectations are well within the range of anticipated wage growth suggested by other sources.

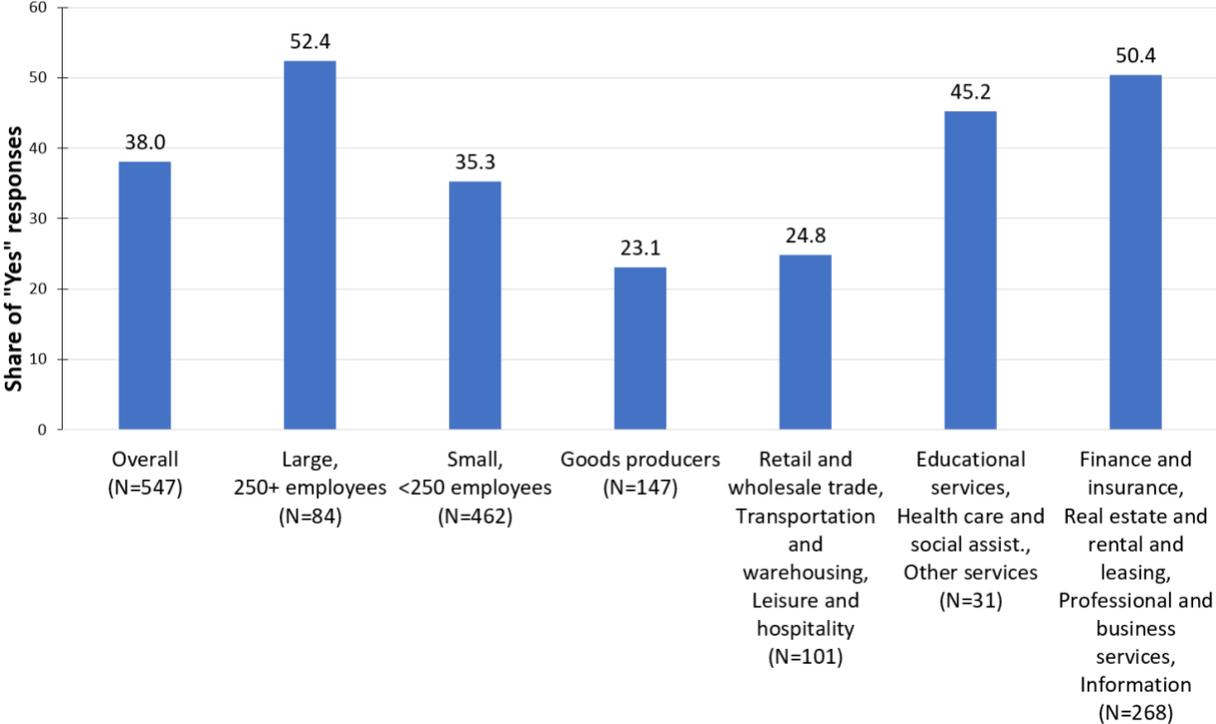
In short, the comparisons in Table 1 give us confidence that the SBU sample yields sensible wage-growth measures that align well with external sources of information.

Turning now to the main issues, we ask each business executive in the SBU the following question: “Over the past 12 months, has your firm expanded the opportunities to work from home (or other remote locations) as a way to keep employees happy and to moderate wage-growth pressures?” According to the responses, 38 percent of firms did so in the previous 12

months. As Figure 1 reports, larger firms and firms in in Education, Healthcare & Social Assistance or in FIRE, Professional & Business Services, and Information are more likely to moderate wage-growth pressures by expanding remote work opportunities.

Figure 1: Percent of Firms that Expanded WFH Opportunities in the Past 12 Months to Moderate Wage Growth Pressures

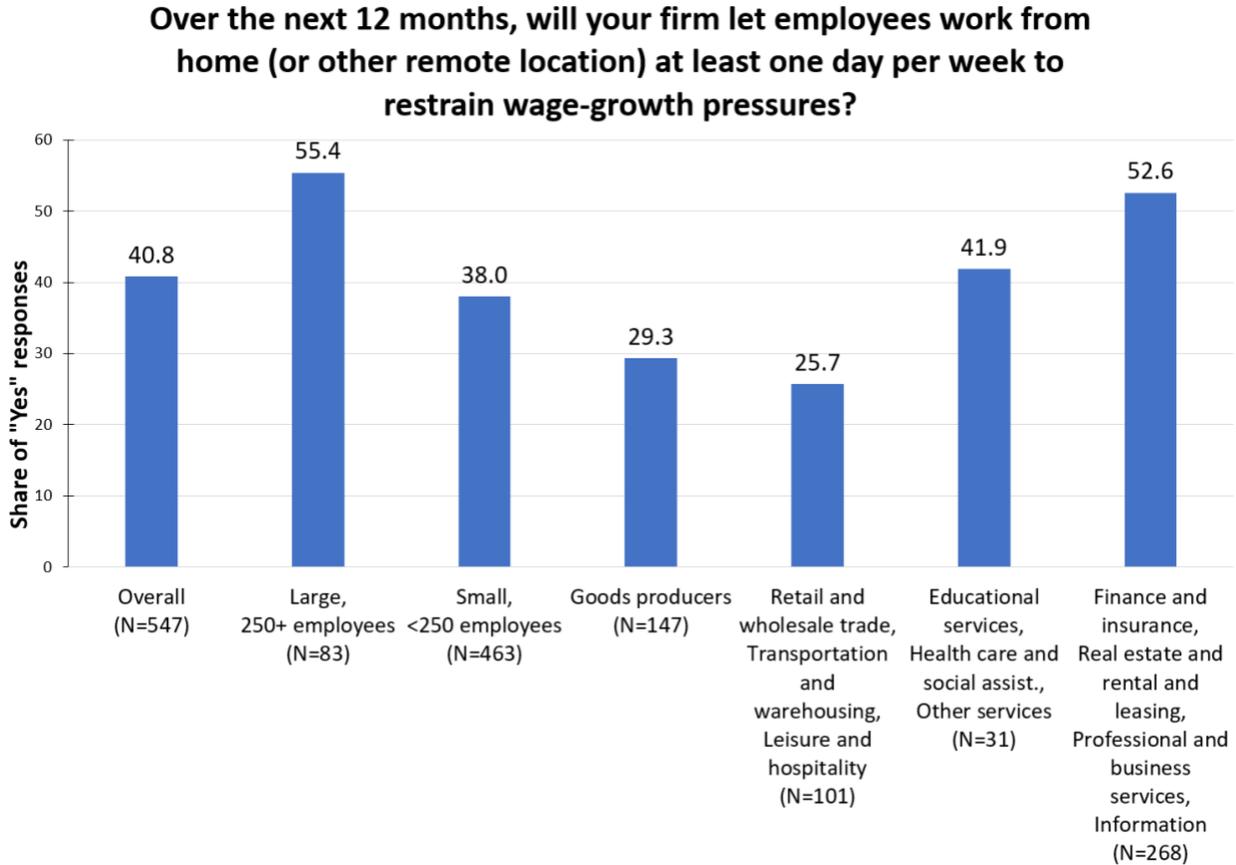
Over the past 12 months, has your firm expanded the opportunities to work from home (or other remote location) as a way to keep employees happy and to moderate wage-growth pressures?



Source: Survey of Business Uncertainty conducted by the Federal Reserve Bank of Atlanta, Stanford University, and the University of Chicago Booth School of Business. Using data from the April and May 2022 survey waves.

As explained earlier, any wage-growth restraint associated with the rise of remote work is likely to lag behind and play out over an extended period of time. Thus, we also ask: “Over the next 12 months, will your firm let employees work from home (or other remote locations) at least one day per week to restrain wage-growth pressures?” Forty-one percent of business executives respond “yes” to this question. As seen in Figure 2, the pattern of responses by firm size and across industry sectors to this forward-looking question is very similar to the response pattern for the backward-looking question.

Figure 2: Percent of Firms that Will Let Employees WFH to Moderate Wage-Growth Pressures in the Next 12 Months



Source: Survey of Business Uncertainty conducted by the Federal Reserve Bank of Atlanta, Stanford University, and the University of Chicago Booth School of Business. Using data from the April and May 2022 survey waves.

To summarize, 38 percent of firms expanded remote-work opportunities over the past year to moderate wage-growth pressures, and 41 percent expect to do so in the coming year. The share of firms that use remote work to moderate wage-growth pressures is higher in industry sectors where the jobs have more scope for remote work.

When a business executive responds “yes” to the question behind Figure 1, we follow up with “What is your best estimate for how much expanded remote-work opportunities have moderated wage-growth pressures at your firm in the past 12 months?”⁸ Likewise, when a

⁸ In fact, only half the firms were eligible to receive this follow-up question (and its forward-looking analog) in our design of the April 2022 survey wave. As a consequence, Tables 2 and 3 below feature a smaller sample count than Figures 1 and 2.

business executive responds “yes” to the question behind Figure 2, we follow up with “What is your best estimate for how much your firm can restrain wage-growth pressures in the next 12 months by letting employees work remotely part of the week?” We use the responses to these two questions to estimate the total wage-growth restraint effect associated with the rise of remote work over the 12 months leading up to April and May 2022 and over the ensuing 12 months. In each case, we assign a zero wage-growth restraint effect to firms that respond “no” to the question behind Figure 1 or Figure 2.

Table 2 reports the results. On a size-weighted basis, we estimate that expanded remote-work opportunities moderated overall wage-growth pressures by 0.9 (0.1) percentage points over the 12-month period ending in April/May 2022. Looking forward, we estimate that expanded remote-work opportunities will moderate wage-growth pressures by another 1.1 (0.1) percentage points in the 12 months following April/May 2022. These estimates have good precision, as indicated by the standard errors reported in parentheses. As reported in Appendix Table A.1, the unweighted means are very similar.

The cumulative wage-growth restraint varies a good deal across major industry sectors, as summarized in Table 3. Over the two years centered on April/May 2022, the unweighted mean wage-growth moderate effect is 1.3 percentage points among Goods Producers and 1.4 points among firms in Trade, Transportation & Warehousing, and Leisure & Hospitality. These sectors offer relatively few jobs that can be readily performed in remote mode. In contrast, the mean wage-growth moderation effect over two years is 2.7 points in Education, Healthcare, Social Services and Other Services and 3.0 percentage points in FIRE, Professional & Business Services and Information. Except for Healthcare, these sectors have a relatively high share of jobs that can be performed in remote mode.⁹

Figure A.1 displays the distribution of cumulative wage-growth moderation values over the two-year period centered on April/May 2022. Most firms report zero moderation. The others report wage-growth moderation values ranging from 1 to 21 percent, with the vast majority reporting values of 11 percent or less. The correlation between look-back and look-ahead wage-growth moderation values is 0.43 in the full set of firms and 0.08 for firms that reported a positive wage-growth moderation effect.

⁹ See Dingel and Nieman (2020) and Hansen et al. (2022) for statistics on the share of jobs that are suitable for remote work (part or all of the week) by industry sector.

Table 2: How Much Did the Rise of Remote Work Restrain Wage Growth Looking Back 12 Months from April/May 2022 and Looking Ahead 12 Months (Percentage points)

	What is your best estimate for how much the expanded remote-work opportunities have moderated wage-growth pressures at your firm in the past 12 months?			What is your best estimate for how much your firm can restrain wage-growth pressures in the next 12 months by letting employees work remotely part of the week?		
	N	Mean	S.E	N	Mean	S.E
Overall	485	0.9	0.10	491	1.1	0.09
Small Firms (fewer than 250 employees)	411	1.1	0.12	417	0.9	0.09
Large Firms (250 or more employees)	74	0.8	0.21	74	1.3	0.24
Goods Producers	134	0.5	0.14	133	0.8	0.14
Retail & Wholesale Trade, Transportation & Warehousing, Leisure & Hospitality	88	0.6	0.17	95	1.2	0.25
Education, Healthcare, Social Assistance, Other Services	29	1.8	0.69	28	2.0	0.44
FIRE, Professional & Business Services, Information	234	1.2	0.15	235	1.1	0.13

Note: This table reports size-weighted means tabulated from special SBU questions fielded from 11-22 April and 9-20 May 2022. The question atop the left (right) panel went to business executives who responded ‘yes’ to the question behind Figure 1 (Figure 2). If a firm responded “no”, we assigned it a wage-growth moderation value of 0. FIRE is short for Finance, Insurance, Real Estate and Rental & Leasing. Table A.1 reports the corresponding equal-weighted means.

Source: Survey of Business Uncertainty conducted by the Federal Reserve Bank of Atlanta, Stanford University, and the University of Chicago Booth School of Business.

Table 3: Wage-Growth Restraint Due to the Rise of Remote Work Over the Two-Year Period Centered on April/May 2022 (Percentage points)

	Mean Cumulative Wage-Growth Moderation Over Two Years	
	Unweighted	Weighted by Firm Size
Overall	2.2	2.0
Small Firms (fewer than 250 employees)	2.2	2.0
Large Firms (250 or more employees)	2.1	2.0
Goods Producers	1.3	1.3
Retail and Wholesale Trade, Transportation and Warehousing, Leisure and Hospitality	1.4	1.8
Education, Healthcare, Social Assistance, Other services	2.7	3.8
FIRE, Professional and Business Services, Information	3.0	2.3

Notes: The entries in this table sum the look-back and look-ahead wage-growth moderation values reported in Table 2 (weighted) and A.1 (unweighted). See Table 2 for notes and sources.

3. Other Labor Cost Effects of the Shift to Remote Work

The shift to remote work can also affect labor costs in other ways. To develop some evidence on this matter, we put the following question to executives at firms that increased their use of remote work over the previous 12 months: “Has this increase in remote work brought other changes at your firm? Please answer [More, Less, No Change] for each of the following:”

Figure 3 summarizes the responses. Increased remote work brought greater (net) use of part-time employees at nearly one-quarter of firms, more use of independent contractors at more than one-fifth of firms, and more use of leased workers at about one-tenth. These developments are likely to lower labor costs. Increased remote work also brought more offshoring at 8 percent of firms (net) and more domestic outsourcing at 6 percent. Again, these developments are likely to lower labor costs. Increased remote work also brought more employment opportunities for physically-challenged persons at 5 percent of firms.

Figure 3: Other Workforce Changes Associated with the Shift to Remote Work



Source: Survey of Business Uncertainty conducted by the Federal Reserve Bank of Atlanta, Stanford University, and the University of Chicago Booth School of Business.

Remote work can also affect employee turnover rates and the costs of hiring and onboarding new employees. Insofar as remote work is complementary to remote job interviews, it may lower hiring costs. Cutting the other way, the onboarding and training of new employees may be costlier (or less effective) for new remote workers, especially when they work in a fully-remote capacity. Finally, the available evidence says that offering remote-work options lowers employee quit rates, reducing turnover costs.¹⁰ This aspect of quit-rate behavior aligns well with other evidence that most employees highly value the option to work remotely one or more days per week.

All told, these observations indicate that the shift to remote work lowers labor costs in other ways, too, in addition to its moderating effect on wage growth. We see no reason to think that these other potential effects on labor costs would, on net, work against the wage-growth restraint effect that we quantify in Section 2 above.

4. Three Implications

A Moderation of Near-Term Inflation Pressures

As we remarked at the outset, average real hourly wages in the U.S. private sector fell 3.0 percentage points over the 12 months ending in May 2022. Over the period from 2007 to 2019, nominal wage growth outstripped CPI inflation by an average of 0.7 percentage points per year.¹¹ This figure offers a reasonable estimate for the (average) real-wage growth that firms and workers expected before the surprise inflation surge. Thus, we adopt a figure of 3.7 percentage points as our estimate for the fall in real wages associated with the surprise inflation surge. We interpret this 3.7 percent figure as the magnitude of the real-wage catchup effect on near-term inflation pressures that Blanchard (2022) highlights in his analysis.

According to Table 3, the rise of remote work moderates wage growth by 2.0 percentage points over two years. This is a cumulative one-time effect arising from the transition to persistently higher levels of remote work. Thus, we conclude that the rise of remote work shrinks the real-wage catchup effect by an estimated 54 percent. This moderating influence lessens

¹⁰ See Barrero, Bloom and Davis (2021a) and Bloom, Han and Liang (2022).

¹¹ As before, we use seasonally adjusted data for the Consumer Price Index for All Urban Consumers (CPIAUCSL_PC1) and the Average Hourly Earnings of All Employees for the Private Sector (CES0500000003_PC1) to measure price and wage inflation, respectively, both downloaded from FRED on 10 June 2022. The latter series is unavailable before 2007.

wage-growth pressures and (modestly) eases the challenge facing monetary policy makers in their efforts to bring inflation down without stalling the economy.

A Source of Decline in Labor's Share of National Income

The rise of remote work constitutes a positive shock to the amenity value of working arrangements. The evidence in Barrero, Bloom and Davis (2021b) suggests that this amenity-value shock equals a few percentage points of aggregate labor earnings. Their evidence for a broad cross section of workers is consistent with experimental evidence in narrower settings developed by Mas and Pallais (2017) and Bloom, Han and Liang (2022). Insofar as firms capture part of this amenity-value shock, it reduces labor's share of national income, as conventionally measured. Tables 2 and 3 provide direct evidence on the extent to which this amenity-value shock reduces (measured) labor compensation.

Labor's share of national income stood at 57 percent in 2019 (Economic Report of the President, 2022, page 38). According to Table 3 above, the rise of remote work reduces labor compensation by 2.0 percentage points over two years. Other things equal, this one-time, out-of-pocket reduction in compensation lowers labor's share of national income by $(0.57)(2.0) = 1.1$ percentage points.¹² This effect on labor's share will persist as long as the rise in remote work and its amenity value endure.

Many other forces affect labor's share of national income and its evolution over time.¹³ Clearly, the amenity-value shock associated with the rise of remote work did not drive pre-pandemic declines in labor's share. By our estimates, the impact of the remote-work amenity-value shock is also modest in size relative to the 6 percentage-point drop in labor's share of national income from 2000 to 2019. However, the impact of remote work on labor's share illustrates complications that can arise when interpreting national income accounting statistics and other statistics on measured forms of labor compensation.

To see this point, note that many observers bemoan the fall in labor's share of national income as a negative development that calls for some type of corrective policy or institutional

¹² Some components of non-wage compensation do not vary directly with wages and salaries. The calculation in the text ignores that complication. Taking it into account would slightly lower the figure reported in the text.

¹³ See, for example, Neiman and Karabarbounis (2014), Autor et al. (2020), De Loecker, Eckhout and Unger (2020), Stansbury and Summers (2020), and Heer, B, A Irmen and B Süßmuth (2022),

response. These calls often rest on the presumption that a fall in labor's share implies a worsening of labor's position relative to that of capital and business owners. That presumption is incorrect when a positive amenity-value shock drives the fall in labor's share of national income. In that case, the fall in labor's share reflects an (average) improvement in the lot of employees that is not captured by measured compensation and, hence, is not captured directly in national income statistics. What national income statistics capture is the sharing of the amenity-value gains with employers in the form of lowered measured compensation.

We are hard pressed to identify another positive amenity-value shock that operates as forcefully at a macroeconomic scale in such a short time period. In this respect, the amenity-value shock associated with the pandemic-induced rise of remote work is unique. However, slow-working developments can also raise the amenity-value share of labor compensation. From 1950 to 2000, the overall tax burden on labor income in the United States rose from 11 percent to 30 percent (Heer, Irmen, and Süßmuth, 2022). This development strengthens the joint incentive for employers and employees to adopt compensation packages with amenities in the form of flexible working arrangements, well-appointed offices, park-like corporate campuses, exercise studios, and the like. These amenities have value to workers, but they are neither taxed nor captured by labor's measured share of national income. Moreover, evidence in Hamermesh (1999) suggests that the income elasticity of demand for workplace amenities exceeds unity. If that characterization holds broadly, it creates a force for the amenity-value share of compensation to rise with real incomes.

A Force for Wage Compression

The U.S. labor market has experienced a sharp compression of relative wages since the onset of the COVID-19 pandemic. Autor and Dube (2022) estimate that real hourly wages rose 6 percent or more in the lower quartile of the earnings distribution from January-March 2020 to January-March 2022.¹⁴ They also show that real wages fell in the upper half of the distribution over the same period, with larger declines at higher deciles. Remarkably, the 90-10 wage differential shrank by about 10 percentage points over this two-year period. It shrank by nearly 15 points when measured over the twelve- or six-month period that ends in January-March 2022.

¹⁴ Autor and Dube obtain nominal wages using Current Population Survey data for outgoing rotation groups, and they deflate using the same CPI-U index as we use above.

It's fair to say that these developments are surprising, even astounding. Indeed, Autor and Dube title their study "The Unexpected Compression." Evidence in our study and other work suggests that this unexpected compression is partly driven by changes in the amenity value of working arrangements and working conditions that operate *differentially* across the earnings distribution (and across industries, occupations, and cities).

Consider, first, the amenity-value shock associated with the rise of remote work. Barrero, Bloom and Davis (2021b, Table 5) estimate the realized amenity-value gains from the pandemic-induced shift to remote work for four earnings groups. According to their estimates, the amenity value of this shift is 1.7 percent of earnings for workers who earn 20-50 thousand dollars per year and 6.8 percent for those who earn 150 thousand or more. The implied high-low differential is 5.1 percent. The evidence in our Tables 2 and 3 supports the proposition that these amenity-value gains accrue partly to employers in equilibrium. If, for example, employers ultimately get half of the amenity-value gains, the effect is to shrink the high-low earnings differential by 2.6 percentage points.

Second, the pandemic negatively affected the amenity value of jobs that involve a high volume of face-to-face contact with customers or coworkers in close physical proximity. Such jobs involve a high risk of exposure to infectious diseases, which is obviously an acute concern during a deadly pandemic. Because the pandemic was such a searing experience, heightened concerns about infection risks will likely linger long after the pandemic itself (Barrero, Bloom and Davis, 2022). For the most part, jobs that involve a high volume of face-to-face contact with customers also offer relatively low pay. Thus, the negative amenity-value shock that disproportionately hit low-wage jobs during the pandemic, and which is likely to endure for some time, also compresses the wage distribution.¹⁵

5. Concluding Remarks

The pandemic-induced shift to remote work is a positive shock to the amenity value of work. Economic reasoning implies that employers and workers ultimately share the resulting amenity-value gains. Since workers reap the direct benefits of the shift at any given wage,

¹⁵ And by the same logic as above, this negative amenity-value shock raises labor's share of national income. In doing so, however, this particular increase in labor's share is not indicative of an improvement in labor's relative position.

employer benefits take the form of wage-growth restraint during the transition to a new equilibrium with compensation packages that recognize higher remote work levels. We develop novel survey evidence to test this mechanism, quantify its force, and draw out its implications.

Looking back 12 months from April/May 2022, about four-in-ten firms say they expanded opportunities to work from home or other remote location to moderate wage-growth pressures. Looking forward, a similar number say they expect to do so in the coming year. Thus, we find clear evidence that the wage-growth restraint mechanism associated with the rise of remote work is operating in the U.S. economy.

Our survey data imply a cumulative wage-growth moderation of 2.0 percentage points over two years centered on April/May 2022. This moderation shrinks the real-wage catchup effect on near-term inflation pressures highlighted in Blanchard (2022) by more than half. We conclude that the recent rise of remote work materially lessens wage-growth pressures. In doing so, the rise of remote work eases the challenge confronting monetary policy makers in their efforts to bring the inflation rate down to acceptable levels without stalling economic growth. That said, we do not see our evidence and analysis as grounds for complacency about near-term inflation pressures or the challenges confronting monetary policy. Our evidence says only that the challenge is somewhat less daunting than suggested by Blanchard's analysis. Other evidence, however, says the challenge is more daunting. See Bolhuis, Cramer and Summers (2022).

We also draw out two other interesting implications of our evidence. First, we estimate that the amenity-value shock associated with the recent rise of remote work lowers labor's share of national income by 1.1 percentage points. Second, we provide evidence that the "unexpected compression" in the wage distribution since early 2020 is partly explained by the same amenity-value shock, which operates differentially across the earnings distribution. These two effects are permanent in the sense that they will persist so long as the rise of remote work and its positive amenity value endure. In contrast, the wage-growth restraint effect is a transition phenomenon that operates as compensation packages adjust to higher remote-work levels.

References

- Altig, D, J M Barrero, N Bloom, S J Davis, B Meyer and N. Parker (2020). “[Surveying Business Uncertainty](#),” NBER Working Paper 25956. Forthcoming, *Journal of Econometrics*.
- Angelici, M and P Profeta (2020), “[Smart-working: work flexibility without constraints](#),” VoxEU.org, 28 March.
- Autor, D, D Dorn, L F Katz and C Patterson (2020), “[The Fall of the Labor Share and the Rise of Superstar Firms](#),” *Quarterly Journal of Economics*, 135, no. 2 (May), 645-709.
- Autor, D and A Dube (2022), “The Unexpected Compression: Employment and Wage Trends Before and After the Pandemic,” presentation to the CBO Advisory Board Meeting, June.
- Barrero, J M, N Bloom and S J Davis (2020a), “[COVID-19 Is Also a Reallocation Shock](#),” *Brookings papers on Economic Activity*, Summer.
- Barrero, J M, N Bloom and S J Davis (2020b), “[60 million fewer commuting hours per day: How Americans use time saved by working from home](#),” VoxEU.org, 23 September.
- Barrero, J M, N Bloom and S J Davis (2021a), “[Don’t Force People to Come Back to the Office Full Time](#),” *Harvard Business Review*, 24 August.
- Barrero, J M, N Bloom and S J Davis (2021b), “[Why Working from Home Will Stick](#),” NBER working paper 28731, April. Statistical updates at www.PolicyUncertainty.com.
- Barrero, J M, N Bloom and S J Davis (2022), “[Long Social Distancing](#),” presentation to the CBO Advisory Board Meeting, June.
- Bergeaud, A, J B Eymeoud, T Garcia, and D Henricot (2022), “[Working from home and corporate real estate](#),” VoxEU.org, 18 January.
- Bick, A, A Blandin and K Mertens (2021), “[Work from Home after the COVID-19 Outbreak](#),” Federal Reserve Bank of Dallas, February.
- Blanchard, O (2022), “[Why I Worry about Inflation, Interest Rates, and Unemployment](#),” Peterson Institute for International Economics, 22 March.
- Bloom, N, R Han and J Liang (2022), “[How Hybrid Work from Home Works Out](#),” slides for a paper in progress.
- Bolhuis, M A, J N L Cramer and L H Summers (2022), “[Comparing Past and Present Inflation](#),” NBER Working Paper No. 30116, June.
- Brynjolfsson, E, J J Horton, A Ozimek, D Rock, G Sharma and H TuYe (2020), “[COVID-19 and Remote Work: An Early Look at US Data](#),” NBER Working Paper 27344.

- Davis, S J (2022), "[The Big Shift to Working from Home](#)," presentation at the NBER Macroeconomics Annual Conference, 1 April.
- De Loecker, J, J Eeckhout and G Unger (2020), "[The Rise of Market Power and the Macroeconomic Implications](#)," *Quarterly Journal of Economics*, 135, no. 2, 561-644.
- Dingel, J I and B Neiman (2020), "[How Many Jobs Can Be Done from Home?](#)" *Journal of Public Economics*, 189 (September).
- Hamermesh, D (1999), "[Changing Inequality in Markets for Workplace Amenities](#)," *Quarterly Journal of Economics*, 114, no. 4, 1085-1123.
- Hansen, S, P J Lamber, N Bloom, S J Davis, R Sadun and B Taska (2022), "Remote Work across Jobs, Employers, and Countries," in progress.
- Heer, B, A Irmen and B Süßmuth (2022), "[Explaining the Decline in the US Labor Share: Taxation and Automation](#)," CESifo Working Paper 9775, May.
- Karabarbounis, L and B Neiman (2014), "[The Global Decline of the Labor Share](#)," *Quarterly Journal of Economics*, 129, no. 1, 61-103.
- Mas, A and A Pallais (2017), "[Valuing Alternative Work Arrangements](#)," *American Economic Review*, 107, no. 12, 3722-59.
- Reifschneider, D and D Wilcox 2022. [The case for a cautiously optimistic outlook for US inflation](#). PIIIE Policy Brief 22-3.
- Stansbury, A and L H Summers (2020), "[The Declining Worker Power Hypothesis: An Explanation for the Recent Evolution of the American Economy](#)," *Brookings Papers on Economic Activity*, Fall, 1-96.
- Vaitilingham, R (2022), "[The Impact of Working from home on productivity, happiness and careers: views of leading economics](#)," VoxEU.org, 4 February.
- United States President, and U.S Council of Economic Advisers (2022), *Economic Report of the President Transmitted to the Congress*. Washington: U.S. G.P.O, April.

Appendix

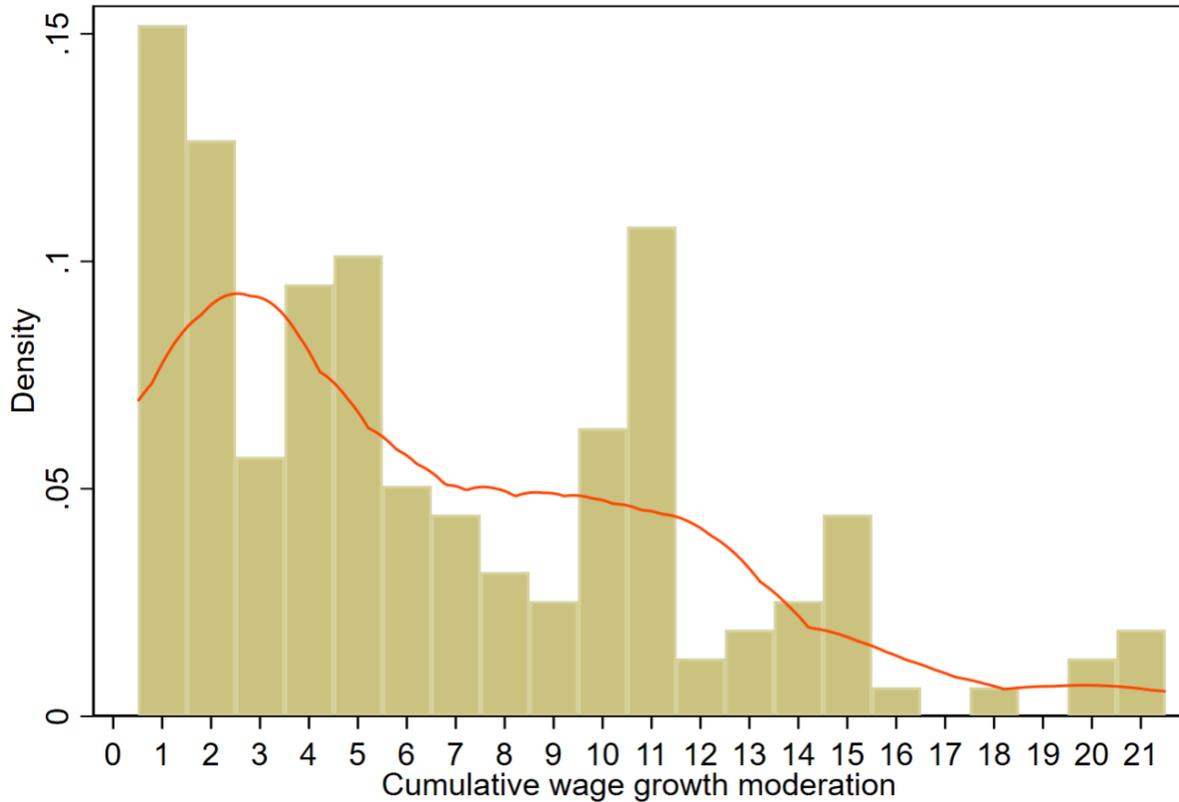
Table A.1. How Much Did the Rise of Remote Work Restrain Wage Growth Looking Back 12 Months from April/May 2022 and Looking Ahead 12 Months (Percentage points)

	What is your best estimate for how much the expanded remote-work opportunities have moderated wage-growth pressures at your firm in the past 12 months?			What is your best estimate for how much your firm can restrain wage-growth pressures in the next 12 months by letting employees work remotely part of the week?		
	N	Mean	S.E	N	Mean	S.E
Overall	485	1.0	0.11	491	1.2	0.11
Small Firms (fewer than 250 employees)	411	1.1	0.13	417	1.1	0.13
Large Firms (250 or more employees)	74	0.7	0.20	74	1.3	0.25
Goods Producers	134	0.4	0.15	133	0.8	0.19
Retail & Wholesale Trade, Transportation & Warehousing, Leisure & Hospitality	88	0.6	0.21	95	0.9	0.24
Education, Healthcare, Social Assistance, Other Services	29	1.4	0.62	28	1.3	0.50
FIRE, Professional & Business Services, Information	234	1.5	0.19	235	1.5	0.18

Note: This table reports equal-weighted means. Table 2 in the main text reports the corresponding size-weighted means. See the notes to Table 2 for additional information.

Source: Survey of Business Uncertainty conducted by the Federal Reserve Bank of Atlanta, Stanford University, and the University of Chicago Booth School of Business.

Figure A.1. The Firm-Level Distribution of Wage-Growth Moderation Values over the Two-Year Period Centered on April/May 2022 (Percentage points)



Note: We have 470 firm-level observations with both backward-looking and forward-looking wage-growth moderation values. (Recall that half the firms in the April 2022 wave were not eligible for quantitative questions about wage-growth moderation.) 239 of these 470 firms say they expanded and/or will expand remote-work opportunities to keep employees happy and moderate wage growth. 71 of the 239 report zero wage-growth moderation in both directions. The histogram and kernel density in the chart above use the observations for the other 168 firms.

Source: Survey of Business Uncertainty conducted by the Federal Reserve Bank of Atlanta, Stanford University, and the University of Chicago Booth School of Business.