# THE RECENT COMPRESSION OF US WAGE INEQUALITY: TIGHTNESS, TURBULENCE, AND POWER-BIASED POLICY

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# The recent compression of US wage inequality: tightness, turbulence, and power-biased policy[*]

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## Abstract

Expansionary fiscal policy and tight post-pandemic labour markets have been seen as correctives to decades of macro-policy that contributed to rising inequality in the US. Reviewing the evidence for and against this perspective, our findings accord with studies that show labour market conditions as an important determinant of nominal wage dynamics. However, the dramatic compression of wage inequality during the recent pandemic and its aftermath was driven primarily by special circumstances, including power-biased policy intervention. Moreover, we caution against interpretations that extend the cyclical relationship between labour market tightness and wage inequality to the long run.

*Key words*: Wage inequality, business cycles, fiscal policy, COVID-19.
*JEL codes*: J31, E32, E62, E65, J42.

## 1 Introduction

The relationship between the cyclical performance of the macroeconomy and distributional outcomes has been hotly debated in the aftermath of the socioeconomic disruptions posed by the COVID pandemic. Initially, most of the

discussion was centred on the causes and (im)permanence of rising inflation and the observed shifts in the functional distribution of income. But the state of labour and goods markets can also influence the wage distribution.

In an interesting and prominent contribution,[1] Autor *et al.* (2024) document a dramatic "unexpected compression" in wage inequality, with about one third of the increase in aggregate 90-10 log wage inequality between 1980 and 2019 having been reversed in the period since 2019. They attribute this compression to expansionary aggregate demand policy and tight labour markets. From this perspective, the aggressive response of aggregate demand policy to the pandemic can be seen as a corrective to decades of macro-policy that has at least been consistent with, if not a direct contributor to, the long run trends in falling income shares for lower ends of the earnings distribution.[2]

Cyclical fluctuations and long-term growth are part of the same dynamic process, but it is dangerous to extrapolate from short-run patterns to claims about the determinants of long run trends. Even if fluctuations in labour market tightness generate movements in wage inequality, a persistent increase in the tightness of the labour market need not have similar effects on wage inequality in the long run, leaving aside questions about the feasibility of maintaining a tight labour market without inflationary consequences.

Focusing mainly on the cyclical dimension, in this paper we consider the evidence for and against the influence of cyclical variations in employment on wage inequality. Using US data, the empirical analysis allows an assessment of the extent to which the dramatic recent compression can be explained by the general tightness of the labour market rather than by the specific circumstances of the pandemic, including the character of the policy responses to the pandemic and changes in workers' attitudes and wage aspirations.

Summarising our main conclusions, there are theoretical and empirical reasons to believe cyclical factors influence relative wages, and indeed we find evidence in line with this proposition. But the recent discussion of the period since the pandemic has over-emphasised labour market tightness and downplayed other factors. The compression is much larger than would be expected from the measures of tightness, and the precise timing of the compression also casts doubt on the tightness argument. Moreover, the observed tightness represented in large part the flip side of the prior contraction during the shutdown at the onset of the pandemic. Thus, turbulence and sectorial demand shifts may have played an important role in the post-pandemic compression; this distinction between tightness and turbulence is critical for policy.

Second, movements in wage inequality are influenced by policy interventions,

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[1]With favourable recognition, for example, in the 2024 Economic Report of the President: https://fraser.stlouisfed.org/title/economic-report-president-45/2024-663301/fulltext.

[2]Katz and Krueger (1999) and Bivens and Zipperer (2018) had reached similar conclusions before the pandemic. Gould and deCourcy (2024) also see labour market tightness as a key factor behind the recent compression.

institutional changes, and power balances. These forces often move gradually with limited short-run effects. The pandemic and post-pandemic period, however, was characterised by abrupt and significant policy-induced shifts in power balances: the composition of the fiscal packages in combination with the accumulation of savings derived from the closing of the service sector greatly improved the bargaining power of low-wage workers. A revaluation of the health risks of many jobs, meanwhile, may have added to workers' wage aspirations and resolve, while the public praise of 'hero workers' in the health and service sectors plausibly contributed to the general acceptance of wage increases as being fair; this acceptance also made it easier for employers to pass on increasing costs and reduced their resistance to wage increases.

Third, by highlighting 'tight labour markets' as the source of reduced inequality, contemporary discourse may lead to a conflation of aggregate demand policy with redistribution, and a failure to distinguish between related but conceptually distinct policies. Tight labour markets and aggressive aggregate demand policy are not unambiguously associated with improved distributional outcomes; the outcome may depend critically on the specific nature of the aggregate demand policy and the measure of distribution one selects (between or within classes, and in terms of disposable or market incomes.)[3]

Section 2 outlines some evidence on trends and cyclical movements in the distribution of income. Section 3 examines specific historical contingencies behind the recent compression, with section 4 presenting supporting econometric analysis of nominal wage dynamics and the role of labour market tightness. The lessons from the post-COVID experience for policy are discussed in section 5. Section 6 offers some concluding remarks.

## 2   Cyclical patterns

**Wage inequality**   The association between labour market tightness and wage inequality depends on the chosen measures of these variables. Some measures focus on distributions across different groups of workers defined by race, sex, age or other demographic characteristics. Our main concern in this paper, however, is the overall wage distribution, and percentile ratios like the 90/10 or the 50/10 ratio arguably provide the simplest and most direct indicator of overall wage inequality. Figure 1 shows no clear association between the employment rate and wage inequality, measured by the p90/p10 relative wage.[4] Except for an

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[3]Tax cuts for the rich, for instance, may reduce market wage inequality (at least in the short run), but it will also generate a direct increase in disposable-income inequality and may shift the functional distribution of income in favour of profit.

[4]It is worth noting that the association identified is sensitive with respect to the definition of full-time employment and the handling of top incomes. Individuals earning weekly incomes above an annual equivalent of $150,000 (individuals earning more than $2884.61 per week) cannot be included without dramatically altering the visualization and adopting a more restrictive definition of full time employment, such as those working more than 40 hours per
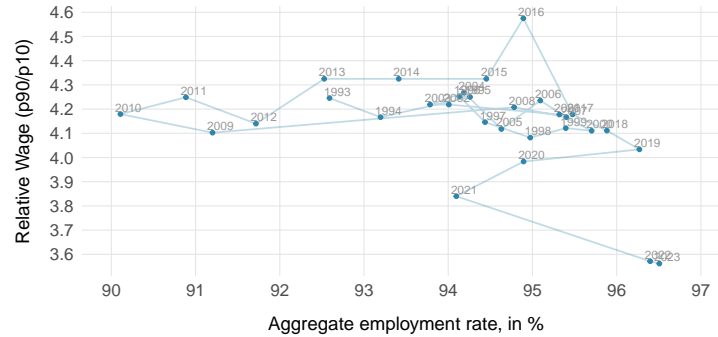
Figure 1: 90/10 relative wage and employment rate

upward blip in 2016, there is little variation in this ratio until 2019. Thus, the 2008 recession and the subsequent slow recovery were associated with a large and persistent decline in employment but very small movements in the 90/10 ratio. This changed after 2019. Wage inequality initially fell alongside a fall in labour market tightness, before continuing its decline as the labour market reversed and tightened considerably. Compositional effects may have contributed to the decline in the 90/10 ratio during the COVID shutdown, with low-paid workers disproportionately laid off. But *a priori* the compositional effects on inequality are ambiguous: they depend on the wage distribution before the shutdown.[5] Moreover, compositional effects cannot account for the decline between 2019 and 2022 which had similar employment rates.[6]

**Employment inequality** Relative wages do not tell the full story of economic inequality. If a group of workers experiences falling employment rates, it will suffer a relative decline in average income, even if the relative wage of employed group members remains unchanged. This kind of inequality cannot be captured using percentile ratios among employed workers. Low wage workers, however, tend to have lower levels of formal education than high wage workers, and using

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week, as in Skott and Aboobaker (2025), significantly alters the figure.

[5]A fall in the employment of low-wage workers unambiguously compresses the wage distribution if the prior income distribution is uniform. But, as a simple example, suppose that the pre-change wage is (approximately) equal to 1 for all workers below the 51st percentile, 1.5 for workers between the 51st and the 91st percentile, and 2 for workers above the 91st percentile. If 10 percent of the workers in the low-income bracket are laid off, the 50/10 and the 90/10 ratios increase from 1 to 1.5 and from 1.5 to 2, respectively.

[6]It may be noted also that adjustments to control for the effects of changes in the demographic composition do not change the qualitative picture of movements in wage inequality in (Autor *et al.* (2024); figure 3A).
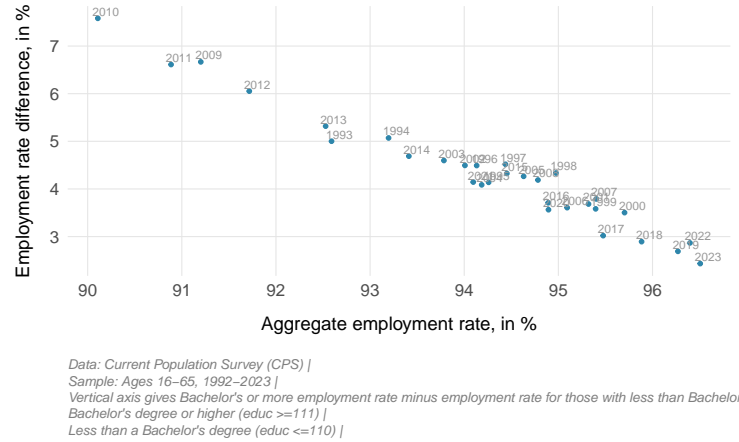
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Figure 2: Aggregate employment and difference in employment rates, by education

education as an example, the level of education affects not just wages but also employment. The employment rate for workers with a college degree tends to be higher than that of those without such a qualification, but there is also a pronounced negative correlation between the aggregate employment rate and the difference between the rates (see Figure 2.)[7]

**Real wages and the functional distribution of income** The evidence points to fluctuations in the functional distribution of income that largely follow a 'Goodwin pattern', with the employment rate leading the wage share (Figure 3)[8]

The cyclical pattern of the wage share affects overall income inequality. While wage inequality may be countercyclical, the top income earners – with a large share of capital income – may see an increase in their share and the bottom half experience a fall in their shares in a boom. A tightening of labour markets and falling wage inequality, in other words, can be associated with a rising profit share and increased overall inequality. This pattern can be observed during the recent period: the profit share rose and, as shown in Figure 4, the share of the

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[7]There are also systematic differences in median wages and employment rates between groups delineated by other characteristics, notably sex or race.

[8]The empirical patterns are described by, among others, Zipperer and Skott (2011) and Barrales-Ruiz et al. (2022). The cyclical interactions between employment and the functional of distribution income have been analysed by, inter alia, Goodwin (1967), Skott (1989); Skott (2023), Barbosa-Filho and Taylor (2006), and Fazzari et al. (2013). In this literature, the profit share is typically driven either by the degree of goods market tightness (positively) or by the degree of labour market tightness (negatively.) Skott and Aboobaker (2025) extend a model of endogenous cyclical fluctuations to include heterogeneous labour and wage inequality. Tavani and Vasudevan (2014), Carvalho and Rezai (2016), and Palley (2017) consider the effects of both the functional distribution and personal inequality on long-run growth in models.
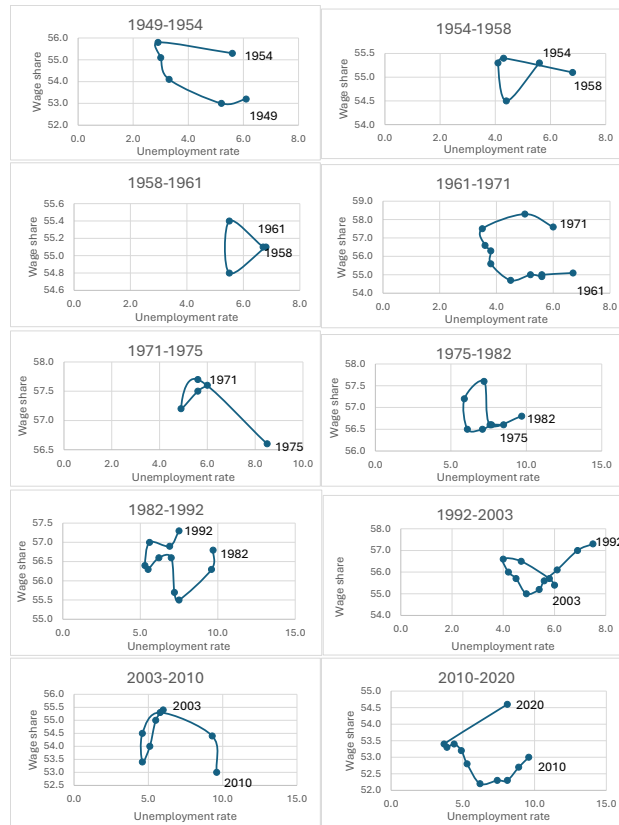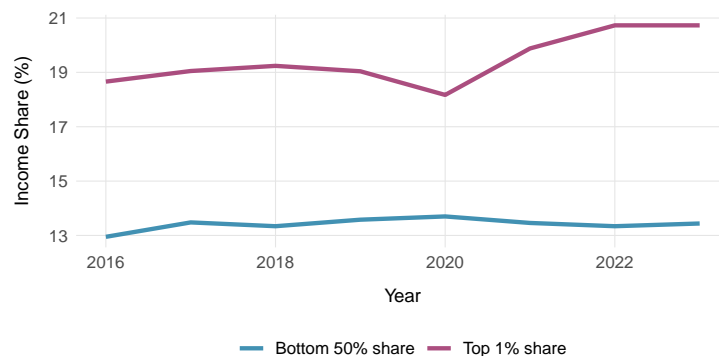
Figure 3: Cyclical movement in functional distribution

Figure 4: WID measure of personal income inequality

top one percent in the US increased from 18.2 in 2020 to 20.7 in 2023 while the bottom 50 percent saw a fall from 13.7 to 13.4.

# 3 The recent compression

## 3.1 Puzzles

Models of the cyclical job ladder show that variations in the degree of monopsony power can be a source of countercyclical movements in wage inequality among identical workers in firms producing the same output.[9]Neither workers nor jobs are identical, however.

The cyclical volatility of employment differs widely among groups of workers. Labour hoarding is limited for workers in (predominantly low-wage) jobs that require little formal education and on-the-job-training but significant for (predominantly well-paid) workers with specialised education and skills; low-wage workers therefore tend to experience more pronounced cyclical volatility of employment than high-wage workers. Although less widely recognised, cyclical variations in mismatch rates may also contribute to the observed patterns: recessions give unemployed, highly educated workers incentives to accept jobs that do not require their skills, thereby accentuating the squeeze on job openings for unemployed low-skilled workers.[10] The differences in employment volatility arguably feed into cyclical movements in relative wages across groups.

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[9]See Burdett and Mortensen (1998) and Moscarini and Postel-Vinay (2018)

[10]This mechanism is discussed in greater detail in Skott and Aboobaker (2025) and Skott (2006, 2023, chapter 7). A database at the New York Fed (Federal Reserve Bank of New York, The Labor Market for Recent College Graduates; https://nyfed.org/collegelabor) shows how high rates of 'underemployment' – the employment of college graduates in jobs that do not
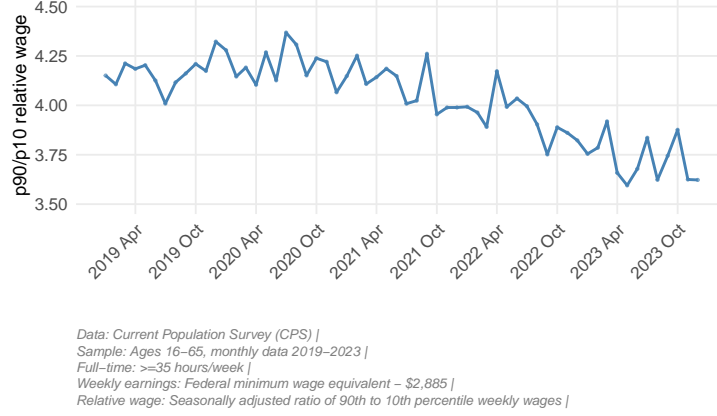
Figure 5: 90/10 relative wage, at monthly frequency

The different mechanisms – fluctuations in monopsony power, differential labour hoarding, and induced mismatch – are not mutually exclusive and all three are related to tightness in some form.[11] Whatever their relative importance for the patterns of wage inequality, however, the post-pandemic compression was much larger than would have been expected based on past correlations between tightness and inequality, and the timing of the compression also suggests that other factors played a decisive role. The standard measures of tightness including the rate of unemployment, the ratio of vacancies to unemployment, the employment to population ratio, and a measure based on a combination of the unemployment rate and employment-to-employment transitions used by Autor *et al.* (2024) were all below their 2019 values during the first half of 2021; Figure 6-Figure 9. Yet, the 90/10 ratio decreased over this period; in fact, the pace of compression was relatively rapid between the second quarter of 2020 and the thrid quarter of 2021.[12] The pace of compression then continued at the same rate from the end of 2021, despite tightness measures that kept rising well into 2022 and stayed above the January 2022 levels until early 2024.

Any inability of the tightness of the overall labour market to account for the observed compression should come as no surprise: the pandemic episode differed from ordinary cycles in crucial ways, and special features of the period may explain the magnitude of the compression. The 'Great Resignation' is one, much-discussed factor: particularly for those without any college education there was

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require a college degree – are associated with high rates of unemployment.

[11]The mechanisms and their implications are discussed in greater detail by Skott and Aboobaker (2025)

[12]See Figure 5. See also Figures 1 and 18 of Autor *et al.* (2024).
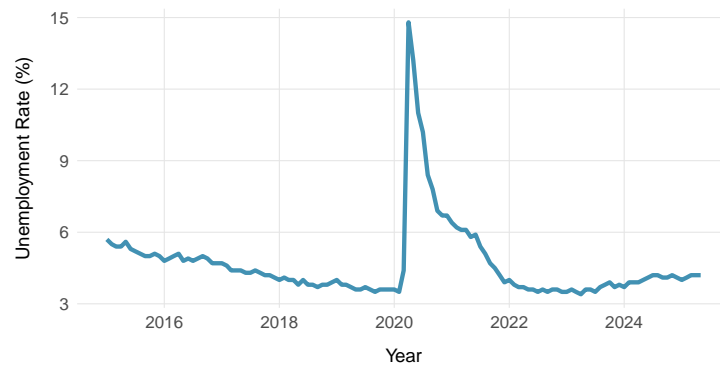
Figure 6: Unemployment Rate
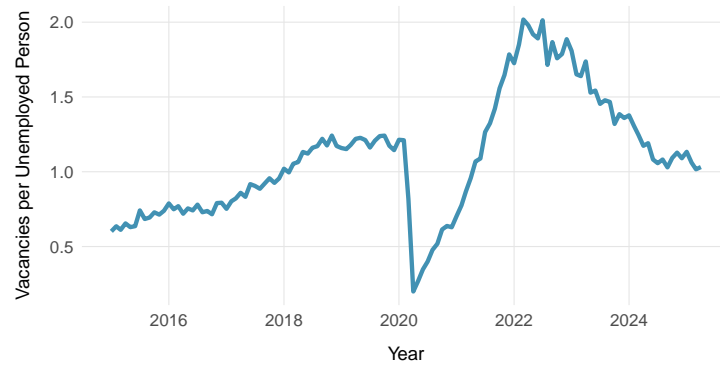
Figure 7: Vacancies per unemployed
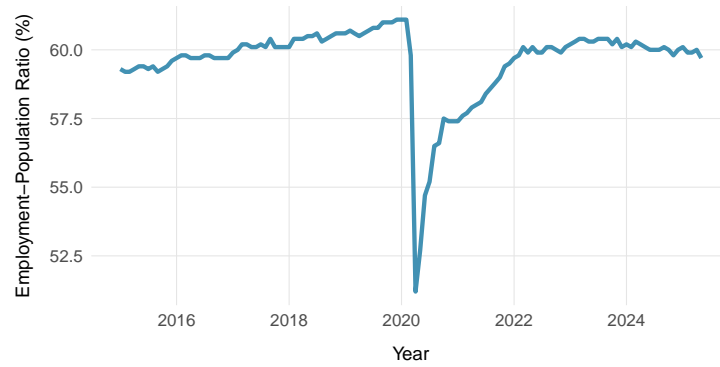
Figure 8: Employment to population rate



A. Tightness

Figure 9: Autor *et al.* (2024) measure of tightness

a post-pandemic uptick in the tendency to quit to unemployment.[13]

Two other factors may have been even more important, both in their own right and because of their interaction with health concerns in creating the Great Resignation. The recent period, first, exhibited unprecedented turbulence and sectorial shifts, derived from lockdowns and shifts in consumption patterns. Fiscal policy interventions, second, differed in both scale and composition from any previous p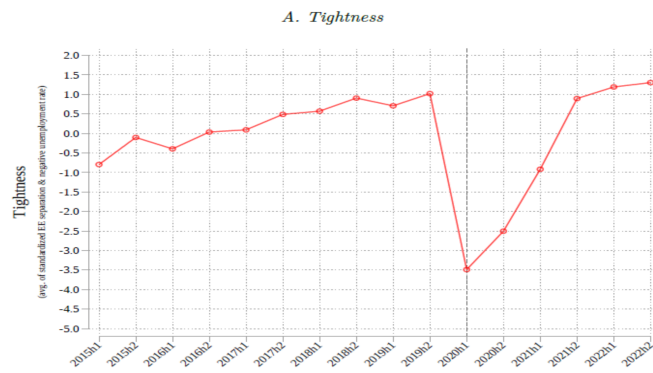olicy intervention during economic downturns, with implications for wage aspirations and the power balance in low-wage labour markets. Although these factors have been noted in the literature, their significance for wage-setting has been largely overlooked.[14]

## 3.2 Turbulence and sectorial shifts

Unemployment exploded during the shutdown in 2020 but had returned to near-prepandemic levels by the beginning of 2022. The reopening generated large-scale hiring and rising wage rates as firms scrambled to find workers. This hiring spree would not have happened without the prior shutdown.

Turbulence of this kind can be a source of rising wages if downward stickiness of money wages prevent wage declines during downturns while rapid hiring during expansions leads to wage growth. If the turbulence had hit all sectors uniformly, there would have been no reason to expect a compression of wage inequality; a more likely result would have been (nominal) wage increases across all groups. The turbulence was not uniform, however: the workers who were most strongly affected (negatively) by job loss at the start of the pandemic happened to be at the low end of the wage distribution.[15]

Consider the leisure and hospitality sector, which accounted for 11 percent of aggregate employment immediately before the pandemic and about 30 percent of the decline in aggregate employment at the start of the pandemic in March-April 2020 (Figure 10.) The initial collapse of employment in leisure and hospitality by 48 percent in March/April 2020 was followed by the return of many workers to their previous jobs in May-September 2020 (but concentrated mainly in May-June), which reduced the employment gap compared with February 2020 to about 22 percent. A slight decline of employment between October 2020 and

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[13]See, e.g., Autor *et al.* (2024), Figures 21-22 in Appendix B.

[14]Autor et al. (2024, pp. 12-13) devote two paragraphs to a discussion of possible effects of the "structure of transfer payments". The transfers, they argue, increased the "dissolution of worker-firm ties" and "weakened existing employer-employee bonds", and may also have raised reservation wages, enabled more job shopping, and facilitated job switching or wage bargaining. The effect of generous unemployment benefit replacement rates is played down, however, because they "appear to have had only a modest impact on job finding rates among the unemployed". Each of the various effects of the transfers, they conclude, "implies a fall in wage stickiness, which is the central mechanism in our search-theoretic model".

[15]If the pandemic shutdown had primarily affected highly paid groups, downward stickiness would have implied increasing wage inequality.

January 2021 was then reversed as hiring picked up and employment increased by about 17 percent between January 2021 and October 2021. Importantly, by 2021 the employment expansion no longer consisted primarily of employees returning to their previous jobs. Firms now had to attract new workers, and the wages of the (mainly low-paid) workers in this sector rose at an annual rate of about 15 percent between January 2021 and October 2021 at a time of low overall tightness of the labour market, average nominal wage growth of about 5.5 percent, and price inflation below 6 percent.[16]

The distinction between turbulence and tightness is important. If disproportionately rapid expansion of employment in low-wage sectors as the economy reopened lies behind the compression, sustained stimulus – generating constant, high shares of employment in these sectors – may do little or nothing to reduce inequality: with a constant sectorial composition, there would be no reason to expect that greater tightness will increase the turbulence within low-wage sectors relative to that within high-wage sectors.

Based on the recent evidence, rather than emphasise the need for a tight aggregate labour market to address wage inequality, one might therefore be prompted to advocate for high turbulence and unstable employment rates in low-wage sectors. This recommendation makes little sense, however. Would the bargaining power of low-wage workers be strengthened by instability? Would the downward stickiness persist, and would firms need to raise wages during expansions in order to attract workers if these workers faced increasingly precarious job situations and greater financial insecurity? The high turbulence of the pandemic period may have been associated with a compression of wage inequality, but it seems highly implausible that the positive correlation between sectorial turbulence and wage growth will generalise to other periods of turbulence. Other special features of the recent period are needed to explain the compression.

Before discussing these features, it should be noted that the sectorial dimension of the turbulence raises other questions. Theoretical frameworks, like the cyclical job ladder, that emphasize how changes in tightness influence wage inequality among identical workers who are employed in firms producing the same output cannot explain changes in inequality among heterogenous workers employed in different sectors.[17]

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[16]Evidence in Autor *et al.* (2024) could be seen as supporting the role of turbulence rather than tightness. The average level of tightness, using the Autor *et al.* (2024) definition, was similar in 2021-2023 and 2015-2019, and the average unemployment rate was higher in the later period. A tightness-based argument would therefore predict roughly similar levels of monopsony (or greater monopsony in the later period if unemployment is used as the indicator of tightness.) Yet, their results indicate that the wage separation elasticity for high-school educated workers under the age of 40 increased in the later period. They interpret this increase as evidence of a decline in monopsony (pp. 23-25; tables 3a-3b.) This interpretation is consistent with an influence of turbulence on monopsony power and wage inequality: the average level of tightness was no higher, but tightness was rapidly increasing and unemployment rapidly falling in 2021-2023.

[17]Autor et al. (2024, p. 15) acknowledge that their theoretical framework – the cyclical
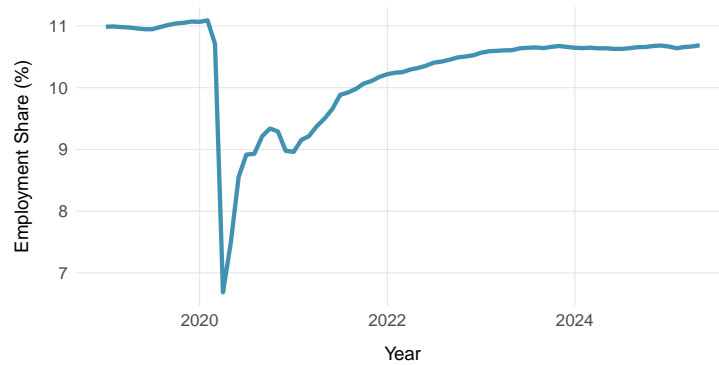
Figure 10: Leisure and hospitality employment share

One can try to get around this limitation by assuming that the economy consists of a number of separate, self-contained labour markets.[18] But compression within separate labour markets need not reduce overall inequality; if an increase in tightness occurs predominantly in high-wage labour markets, aggregate inequality will tend to increase.[19] Staying with leisure and hospitality, moreover, contrary to predictions from the cyclical job ladder framework, there is a little evidence in favour of the predicted wage compression within this sector. On the contrary, wage inequality among workers in leisure and hospitality with less than a BA has increased slightly after the pandemic; Figures 11 and 12.

In short, the distribution of average wages across different segments of the labour market – rather than changes in equality within each segment – can be critical for the determination of aggregate wage inequality; the leisure-and-hospitality evidence suggests that this has been the case during the recent compression. Thus, by focusing on compression within a single labour market with identical workers, the cyclical job ladder may fail to capture the most important forces behind the recent compression.

## 3.3 Power-bias and aspiration shifts

The high turbulence during the recent period was accompanied by other elements without which there might have been no compression. The health con-

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job ladder – cannot predict the effects of tightness on wage inequality across skill categories.

[18]Workers can and do move between jobs with different characteristics. This undermines the strict separability assumption, but not the difference between workers and the presence of distinct segments of the labour market.

[19]Skott and Aboobaker (2025) provide a straightforward illustrative example.

Figure 11: Wage inequality within leisure and hospitality

Figure 12: Wage inequality within leisure and hospitality

cerns and the Great Resignation, discussed briefly above, may have played a role by reducing the labour supply. But fiscal interventions were arguably much more important for the compression. Without these interventions we might have seen little or no compression and a much milder rate of resignation.

**The policy packages**   The COVID fiscal policy packages authorised expenditure of more than $4.5 trillion. Most of the spending went to businesses, states, public health, education, and a range of smaller programs. But about $1.8 trillion was paid out to households in one form or another, the largest being stimulus checks (approximately $850 billion) and supplemental federal unemployment insurance (approximately $700 billion.)

The average pre-COVID replacement rate among unemployment benefit recipients was about 40 percent, and only about one third of the unemployed received benefits. This picture changed dramatically when the pandemic hit. The CARES Act from March 2020 introduced supplementary federal unemployment insurance, providing an extra, flat-rate $600 a week on top of the regular (state level) benefits; meanwhile the recipiency rate – the proportion of the unemployed filing for unemployment benefits – jumped from 28 percent in 2019 to 78 percent in 2020. To put this policy in pers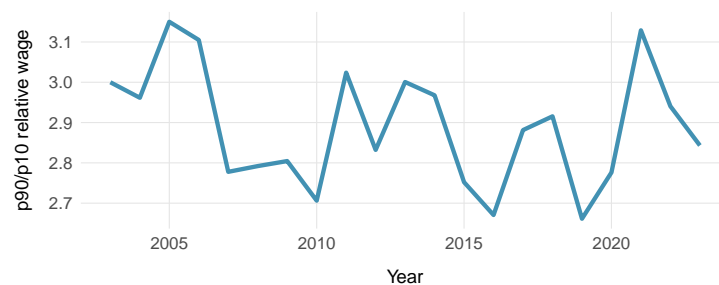pective, with a 35-hour work week the supplementary benefit corresponded to more than $17 an hour at a time when the federal minimum wage was $7.25 and all state minimum wages were below $15. Thus, even disregarding regular unemployment benefits, the supplementary federal benefit gave many low-wage workers replacement rates well above 100 percent. The CARES Act also extended the benefit period and expanded the eligibility to include many gig workers and self-employed.

The federal supplement in the CARES Act was set to expire at the end of July 2020. Another program, the Lost Wages Assistance Program, then provided up to $400 a week in supplementary benefits from August till the end of December 2020,[20] when the Consolidated Appropriations Act introduced supplementary federal benefits of $300, initially for 11 weeks but subsequently extended until September 2021 by the American Rescue Plan (March 2021.) Even this lower supplementary benefit of $300 would, on its own, have given a worker on federal minimum wages a replacement rate above 100 percent. Taking into account the regular state-level unemployment benefits, estimates by Ganong *et al.* (2020) imply that the supplemental benefits of $600 weekly raised the overall replacement rate of the median unemployed worker to 145%, while the lower supplemental benefits of $300 raised it to 95%.

Low-income households also benefited disproportionately from other provisions in the various packages. Flat-rate stimulus checks were sent to households with annual incomes below certain thresholds. The CARES act included $1200 per

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[20]The Lost Wages Assistance program was created by executive order and implemented through the Federal Emergency Management Agency (FEMA). Unlike the federal supplementary unemployment benefits, the FEMA benefits were often subject to delays and the application process was more complicated.

adult and $500 for dependent children under 18; the America Rescue Plan gave $1400 to all adults as well as to their children and other dependents. The America Rescue Plan also introduced expanded, refundable child tax credits, while the Consolidated Appropriations Act included a refundable $600 tax relief per adult and child. For a family of four these stimulus checks, tax cuts and child benefits added up to more than $13,000. Other COVID measures provided for paid sick leave, cash grants to students and the suspension of payments and interest accrual on student loans.

As a result of these programs (and the curtailment of household spending on many services during the shutdown) household balance sheets improved during the COVID pandemic. For high-income households most of the improvement derived from capital gains on housing and stocks. For low-income households, which typically do not own shares and often rent their homes, the improvements came from increased saving. The excess saving of the bottom two income quintiles (their saving over and above what would have been expected based on pre-pandemic trends) accounted for 29 percent of the total amount of excess saving between March 2020 and December 2021, a proportion that greatly exceeds the income share of these households (Batty *et al.* 2021). The mapping of these estimates into excess saving and wealth changes for a typical low-income household is complicated, but the estimates suggest an increase in wealth of between 22 and 145 percent for the median household in the bottom quintile (Barnes *et al.* (2022)).

The fiscal interventions and the changes in households' financial positions affected wage-setting, especially for low-wage workers who had benefited disproportionately from the programs.[21] Unemployment benefits remained at unprecedented levels until September 2021, and even when these benefits had expired, the improvement in workers' financial situation meant that they could now afford to be more selective. Combine these factors with lingering health concerns and it is not surprising that wages did not decline when unemployment soared and that there were large increases in the absolute and relative wage at the low end of the distribution during the hiring spree in 2021.

Some part of the rise may be due to what can be seen as 'market effects' associated with the interventions. High benefit levels raised reservation wages, which would affect wages even in traditional neoclassical models of perfect competition. These models provide a poor approximation to real-world labour markets, but the effects carry over to, and may be accentuated in, models with 'imperfections'.

Autor *et al.* (2024) highlight how their model with frictions fits the data better than traditional friction-less models. Frictions exist and are important, and frictions generate monopsony effects, with firms' monopsony power decreasing

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[21] Not all unemployed workers received unemployment benefits. But workers without benefits gained jobs and wage increases because of the increase in the reservation wage of those who did receive benefits.

as labour markets tighten. But the universe of economic theory need not be restricted to a choice between the frictionless neoclassical model and search and matching models with uniform workers and perfect optimisation.

As argued above, the cyclical job ladder says nothing about inequality across different groups of heterogeneous workers. Monopsony and monopoly, moreover, are not the only sources of power in the struggle over distribution. Power balances are influenced by institutional and technological forces – including the extent of unionisation (itself influenced by legal and regulatory frameworks) and the ability of firms to monitor workers and their 'effort' and productivity.[22] They can also change for other reasons, however.

Unlike most technological and institutional changes, fiscal interventions can have significant short-run effects on wage setting, and the policy response to COVID was power biased in favour of low-wage workers.[23] Their fallback position improved greatly as a result of the fiscal packages. An indebted household living from paycheck to paycheck can be forced to accept bad jobs to avoid disastrous economic and social implications. The presence of alternative sources of income (like enhanced unemployment benefits) or windfall gains (like stimulus checks) means that the consequences of unemployment become less disastrous, thereby allowing workers to be more selective and demand higher pay, despite the associated increase in the risk of being laid off or failing to get a job.[24]

An increase in unemployment benefits has obvious implications for the balance of power. Windfall gains and positive shocks to households' financial position, by contrast, would have limited effects on the labour supply in standard models of intertemporal optimisation. Intuitively, a positive shock to wealth has consumption effects that are spread out over the whole trajectory of consumption, which greatly reduces its impact on current consumption; a relatively inelastic labour supply, moreover, implies that the optimal proportionate reduction in labour supply is smaller than the proportionate increase in consumption.[25]

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[22]See Guy and Skott (2008) and Skott (2023, chapter 7) for a discussion of power biased technological and institutional change.

[23]Fiscal policy typically has distributional effects. Building a new public swimming pool, for instance, brings greater benefit to households that will use the pool than to those who will not. This distributional effect does not make the policy power biased.

We use the term power-biased to describe policy interventions that have a significant impact on the balance of power between different classes and groups, thereby affecting the outcomes in areas that are subject to conflict, such as wage-setting.

[24]Kim *et al.* (2019) analyse interactions between household indebtedness, workers' bargaining strength, and the distribution of income.

[25]A benchmark household optimization problem can be written

$$\max \int e^{-\rho t} u(c, l) dt$$
$$s.t.$$
$$\dot{a} = ar + w(1-l) - c$$

where $c, l, (1-l), a, w, \rho, r$ are consumption, leisure, labour supply, (non-human) wealth, the

The behavioural evidence shows systematic deviations from the standard model, however. Current consumption reacts more strongly than the model predicts to changes in current income, while predictable future changes in income have limited effects on consumption until implemented.[26] The standard model also misrepresents the employment relation. The labour market is one of 'contested exchange' using the terminology of Bowles and Gintis (1993). Capturing this aspect, some efficiency wage models relate workers' effort on the job to the cost of job loss (e.g., Bowles (1985)); other versions emphasize the influence of fairness norms, with unfair wages generating resentment and provoking reactions from workers that reduce labour productivity (e.g., Akerlof and Yellen (1990).)[27] Both of these different versions of the efficiency-wage argument imply that workers' effort and productivity will be influenced by their own overall situation as well as by their wage. If losing a job spells economic and social disaster, the fear of job loss will dampen their reaction to a low wage.[28] Conversely, an improvement in workers' financial position and their ability to cope with losing their job will make for a stronger response to low wages and unfair treatment.

The pandemic may have affected not just workers' response to unfairness but also the norms of fairness. Social norms typically exhibit strong inertia, but the obvious health risks of frontline workers (and perhaps also the increased visibility of these workers and their importance when COVID struck) appear to have spurred an increase in support for higher minimum wages, suggesting a significant shift in wage norms among the general public. In Public Agenda/USA Today/IPSOS polls the share of people expressing strong or moderate support for "raising the minimum wage so that every full-time job provides enough income to keep people above the poverty line" jumped from 65 percent to 72

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real wage, the discount rate and the rate of interest

Using a standard specification of the utility function, let $u(c,l) = (c^{1-\theta}-1)/(1-\theta)-\nu(1-l)^{\eta}$ where $-\infty < \theta < 1, \nu > 0, \eta > 1$. The first-order conditions imply that

$$
\begin{aligned}
u_l &= \nu\eta(1-l)^{\eta-1} = wc^{-\theta} = wu_c \\
\hat{c} &= \frac{1}{\theta}(r-\rho)
\end{aligned}
$$

Stimulus checks, tax cuts and child benefits of \$13,000 provided a positive wealth shock of 32.5 percent of annual income for a family with an income of \$40,000. With empirically plausible values of the parameters, however, the implied decline in the current labour supply (for a given real wage) will be very small: if $r = 0.05$, current consumption will rise by less than 2 percent, and evidence points to relatively inelastic labour supply, that is, a large value of $\eta$; Romer (2018, p. 277) uses $1/(\eta-1) = 0.11$ in his numerical example, implying that the labour supply falls by less than 0.2 percent in the benchmark case with $\theta = 1$.

[26]Early studies include Campbell and Mankiw (1989) and Shea (1995); Skott (2023, chapter 3) offers a broader discussion of behavioural deviations from the standard model.

[27]Fehr *et al.* (2009) and Bewley (1998), among others, provide experimental and real-world evidence on the role of fairness norms and reciprocal behaviour in labour markets. See also Skott (2023, chapters 6-7.)

[28]This deterrence effect helps explain weak wage pressures in the pre-COVID period despite smouldering outrage over stagnant wages and exploding inequality.

percent between February and August 2020; the increase among Republican voters was particularly strong, going from 48 percent in February to 62 percent in August (Public Agenda (2020)). Changes in popular views have had some effect on minimum wages at the state level. The federal minimum wage has remained stuck at \$7.25 an hour since 2009, but at the state level there have been significant increases, with 30 states and DC now having a minimum wage above the federal level. In all of these states the minimum wage has increased between 2020 and 2024. Including scheduled future increases, nearly half of all US workers will be in states with a minimum wage of at least \$15 by 2027 Hickey (2024).

The shift in fairness norms has arguably been accentuated by the elevation of frontline workers in the health and service sectors to the status of 'hero workers'. This elevation may have been motivated, at least in part, by a cynical attempt to get low-paid workers to put their lives at risk without increased monetary compensation, and the attempt was partially successful, with some groups responding in this way. But as pointed out by Cameron *et al.* (2024), when organisations praise workers as heroes, some workers may "become even more disenchanted with the organization, seeing the praise as disingenuous in the absence of other improvements in work conditions, such as increased pay, opportunities for advancement, or meaningful ways to advocate for organizational changes". Repeated strikes in non-unionised companies like Amazon and Starbucks during the COVID years and greatly increased efforts at unionisation in these and other companies point in this direction (Rosenbaum 2022).

Other indicators of public opinion have been changing. The public overwhelmingly sided with workers in the prolonged strikes by autoworkers and Hollywood screen writers in 2023: 57 percent supported and 31 percent opposed the autoworkers, while 60 percent supported and 27 percent opposed the screenwriters according to a Reuters/IPSOS poll.[29] The evidence shows more broadly that in "labor disputes from the last few years, Americans are more likely to say that they have sided with unions rather than companies" IPSOS (2023). The number of strikes and the number of workers involved in collective action have also increased in recent years[30], but large variations from year to year makes interpretation difficult (Poydock and Sherer 2024).

As another example, public approval of unions has increased from 64% in August 2019 to 71% in 2022, a level not seen since 1965; the share of people who would like to see labour unions having the same or more influence than today jumped from 65% to 73% between 2018 and 2023, and the share of people that think labour unions help the overall economy reached a record-high 61% in August 2023 (Gallup 2024). Recent polling also shows that a majority of workers in

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[29]Another shift in public sentiment has led to heightened rates of government monitoring members of the public with negative sentiments of health insurance companies (Klippenstein 2025).

[30]see Petach (2024) for related evidence and discussion.

the U.S. across all sectors–59%–support unionisation in their own workplace (Rosenbaum 2022). These changes have not, as yet, produced any substantial increase in the extent of union coverage; in 2023 unionisation rose from 6.8 to 6.9 percent in the private sector but declined from 36.8 to 36.0 in the public sector. Unionization drives have succeeded, however, in making gains in previously non-unionised, low-wage companies like Amazon and Starbucks. These limited successes have been achieved despite fierce opposition from employers and nearly 50 years of legislative changes to the National Labor Relations Act (NLRA) that weakened unions and their ability to organize Domhoff (2013); Schierholz *et al.* (2022).

## 4  Wage-Phillips estimates

Considering the role of labour market tightness in wage dynamics relative to other factors naturally lends itself to an estimate of wage-Phillips curves. The wage-Phillips relation has been a subject of almost constant conversation across a variety of traditions in modern macro and labour economics over much of the last seven decades.[31] Phillips' (1958) initial characterisation of the role of labour market slack in wage-setting related the level of unemployment to the growth rate of money wages and was tested for using highly aggregate data. Even though concerns about potential bias in the econometric analysis conducted by Phillips emerged almost immediately (Samuelson and Solow 1960), it is primarily since Blanchflower and Oswald (1994; 1995) that attempts to test for the relationship, or related variations, moving beyond macroeconomic aggregates have been increasingly widespread.

Having discussed some graphical associations between distribution and the state of the cycle in previous sections, in this section we analyse the association with particular interest in: the association between state-level relative wage measures and labour market conditions, how *nominal* wage dynamics among different quintiles of the earning distribution have varied with labour market conditions, and the association between wage growth and labour market conditions by educational attainment. We explore these associations over the business cycle in general (across all periods) and in the aftermath of COVID particularly.

In the process, we contribute to a growing literature that makes greater use of within-country cross-sectional variation to estimate wage- and price-Phillips curves (Kumar and Orrenius (2016); Leduc and Wilson (2017); Beraja *et al.* (2019); Hazell *et al.* (2022); Domash and Summers (2022); Autor *et al.* (2024).) Part of the motivation for making greater use of regional data lies in overcoming issues related to small national samples (with infrequent episodes of exceptionally tight labour markets), as well as the endogeneity of monetary policy that can confound estimates using national time-series data (Fujita (2019); Hooper *et al.* (2020); Fitzgerald *et al.* (2024).)

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[31]Chapter 5 of Skott (2023) addresses the topic in greater depth.

For all of our econometric exercises we use monthly CPS data for the 2000-2023 period (Flood *et al.* (2023)) and BLS-LAUS state unemployment data, also at the monthly frequency for the corresponding period. We restrict the sample to the working age population (16-65, inclusive) in full-time employment (working 35 hours and above) earning at or more than the full-time weekly equivalent of the federal minimum wage and less than an annual equivalent of \$150,000 per annum.[32] We include both public and private employees in our sample. We use this data to construct college-educated, union status, sex, and race dummies. In line with the rotating structure of the CPS, we also filter for individuals with one pair of weekly earnings measures twelve months apart.

An important issue concerns whether or not to omit 2020 from the analysis. The pandemic period was characterised by large compositional shifts. Initially, layoffs affected low-wage workers disproportionately, thereby raising average wages.[33] These compositional effects could be largely avoided by leaving out the year 2020 from the estimation.[34] However, omitting 2020 would also omit many of the special factors that plausibly drove the unusually large compression; correspondingly, for our final set of estimates we look at the sensitivity of coefficients to leaving out 2020, presenting both findings with and without 2020.

For a first set of estimates (of Equation 1), estimating the association between state unemployment and state-level measures of relative hourly earnings (the p50/p10, p90/p10, and p90/p50), six half-year time dummies corresponding to the period from 2020-2022 are also used to capture different phases in the economic repercussions of the pandemic.[35] This approach allows us to continue exploiting the cross-sectional variation afforded by state-level measures of labour market slack, but with the downside of lost capability to analyse a dependent

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[32]I.e., those with a weekly wage between the federal minimum and \$2885.

[33]See Figure 16, Figure 17.

[34]This is the approach in Autor *et al.* (2024) in their state-level Phillips curves (their Equation (5) and Tables 1a-1b). Our estimation procedure differs from Autor *et al.* (2024) in multiple respects. Our estimation period is longer, for one set of estimates we measure our dependent variable at the individual level, for our state level estimates we analyse the average change in log earnings rather than the change in average log earnings, and we use the unemployment rate as our primary measure of tightness. Autor *et al.* (2024) define tightness as an average of (the negative of) the unemployment rate and measure of employment-to-employment (EE) transitions. We prefer the unemployment rate as a measure of tightness insofar as the EE transition rate rises when firms open high-wage jobs, while the employed will have no incentive to move to new jobs with low wages. It would not be surprising, therefore, if EE transition rates are positively associated with wage growth. But this association says little or nothing about causation; if anything, it might be more reasonable to regard wage increases as the determinant of EE transition rates.

[35]Ideally, post-COVID time dummies would correspond to the following policy timeline: 1) an initial shutdown with large one-time cash transfers and reopening with workers returning to past employment (March-December 2020), 2) an expansionary period with firms looking to hire new workers alongside large transfers (January-September 2021), and 3) a period with no new federal insurance or transfers to individuals (October 2021 onwards). However, these periods do not cross over neatly with the inclusion of our half-year time fixed effects, which would complicate interpretation of the estimates.

variable measured at the individual level. This in turn implies inability to control for important demographic factors that influence an individual's wage setting power.

$$RelWage_{sh} = \beta_1 UnempRate_{sh-1}$$
$$+ \sum_{a=1}^{6} \gamma_a (PostCOVID_{\overline{h}+a} \times UnempRate_{s(\overline{h}+a-1)})$$
$$+ \alpha_s + \lambda_h + \varepsilon_{sh} \qquad (1)$$

Here, $RelWage_{sh}$ captures one of three measures of the relative wage (the p50/p10, p90/p10, and p90/p50 ratios of hourly earnings) at the state level in a given half-year. $PostCOVID_h$, $UnempRate_{sh-1}$, $alpha_s$, $lambda_h$, and $varepsilon_{sh}$ are time dummies for post-COVID half-years, the state unemployment rate in the preceding half-year, a state fixed effect, a half-year fixed effect and the error term, respectively. The results from estimating this equation are reported in Table 1. We hypothesise that while a general positive association between labour market slack may be prevalent, after COVID, much of the compression may have happened despite slack, manifesting itself in a negative association between state unemployment levels and state wage inequality (reflected in our three relative wage measures.)

In general, row 1 of Table 1 shows that inequality measured at the lower end (the p50/p10 relative wage) tends to increase with the unemployment rate. In contrast, interacting our post-COVID dummies with the unemployment rate in the previous half-year, we find a persistent negative (and significant in 2020H2, 2022H1, and 2022H2) association between the p90/p10 and slack after COVID. This evidence appears to be in line with the proposition that much of the recent compression of the wage distribution happened *despite* the initial slackening (and in line with a simple reading of Figure 1.)

To augment the analysis reflected in Table 1, we consider the wage-Phillips relation at different quintiles of the earnings distribution. This helps generate results with a direct relation to the wage distribution at chosen percentiles whilst accounting for some of the individual-level factors omitted when conducting pure state-level analysis. The dependent variable is the 12-month change in log earnings per individual, grouped by state-half-year-quintile.[36] Correspondingly, we estimate Equation 2, showing the association between wage growth and slack in different quintiles of the wage distribution $q$. Figure 13 demonstrates the association between slack (measured here, again, with the unemployment rate) and nominal wage growth by quintile of the initial earnings level distribution, controlling for individual characteristics.[37] Estimates at different quintiles are

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[36]Individual-level demographic controls include: age, age-squared, gender, race, and union membership, given by $X_{it}$ and $Z_i$.

[37]In contrast to Equation 1.

Table 1: Estimates of equation 1

| | Dependent variable: | | |
|---|---|---|---|
| | p50/p10 | p90/p10 | p90/p50 |
| | (1) | (2) | (3) |
| Unemp. Rate (h-1) | 0.006* | 0.004 | −0.005 |
| | (0.003) | (0.008) | (0.003) |
| 2020H1 × Unemp. Rate (h-1) | −0.018 | −0.022 | 0.011 |
| | (0.015) | (0.043) | (0.021) |
| 2020H2 × Unemp. Rate (h-1) | −0.006 | −0.029* | −0.009 |
| | (0.005) | (0.017) | (0.007) |
| 2021H1 × Unemp. Rate (h-1) | 0.001 | −0.024 | −0.013 |
| | (0.006) | (0.020) | (0.008) |
| 2021H2 × Unemp. Rate (h-1) | −0.005 | −0.032 | −0.010 |
| | (0.009) | (0.030) | (0.014) |
| 2022H1 × Unemp. Rate (h-1) | −0.002 | −0.055** | −0.024 |
| | (0.014) | (0.022) | (0.016) |
| 2022H2 × Unemp. Rate (h-1) | −0.011 | −0.065** | −0.018 |
| | (0.017) | (0.032) | (0.021) |
| State Fixed Effects | Yes | Yes | Yes |
| Half-Year Fixed Effects | Yes | Yes | Yes |
| Clustered SE | State | State | State |
| Observations | 2,397 | 2,397 | 2,397 |

*p<0.1; **p<0.05; ***p<0.01. Note: CPS data 2000-2023, public and private sector employees aged 16-65, 35+ hours/week, weekly earnings above federal minimum wage threshold and below $2,885. State unemployment data from the BLS.

obtained for different sub-periods omitting 2020, including pre-2020, post-2021, and across all periods. $\alpha_{sq}$ give state fixed effects for a given quintile, $\delta_{hq}$ give half-year fixed effects, $X_{it}$ and $Z_i$ give time varying and invariant demographic controls respectively, and $\varepsilon_{istq}$ is the error term.

$$\Delta_{12-month} \ln(Wage_{istq}) = \beta_{1q} UnempRate_{sh-1} + \beta_{2q} X_{it} + \beta_{3q} Z_i \\ + \alpha_{sq} + \delta_{hq} + \varepsilon_{istq} \tag{2}$$

What we observe from this analysis is general evidence for a wage-Phillips relationship that is particularly strong at lower quintiles, but which weakens considerably from 2021 onward, thereafter demonstrating a (weakly) positive association at the lower end of the distribution after COVID. We see this as again compatible with a hypothesis emphasising the special role played by unemployment insurance and other transfers during this extraordinary period for nominal wage growth at the lower end of the earnings distribution.
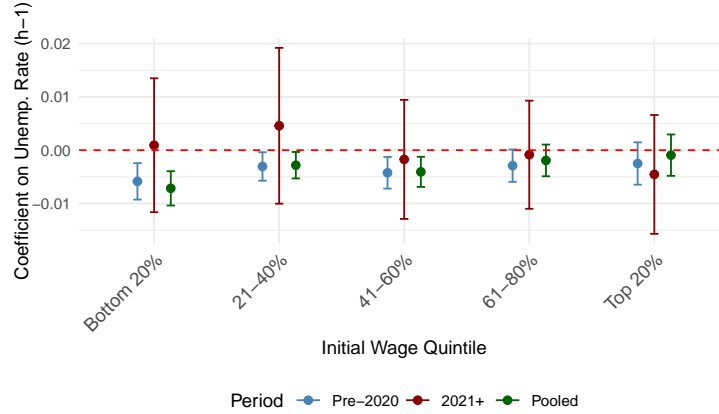


Figure 13: Estimates of equation 2

An alternative approach to that provided by estimates of Equation 2 might look again at analysing a single state-level outcome variable, such as the *average* change in log hourly earnings within a given state-half-year-quintile, and using multiple measures of labour market conditions.[38] Consequently, the demographic control variables are transformed to the average demography of a given group (rather than the individual demographic controls), and as given in Equation 3.

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[38]Including not just the unemployment rate, but an alternative measure that, following Autor *et al.* (2024), integrates employment-to-employment separations.

$$Avg_{shq}(\Delta_{12-month}\ln(Wage_{istq})) = \beta_{1q}LMConditions_{sh-1} + \beta_{2q}X_{st}$$
$$+ \alpha_{sq} + \delta_{hq} + \varepsilon_{shq} \tag{3}$$

The results from this analysis (Figure 14) are broadly consistent with the individual-level analysis, suggesting again a large change in the coefficient on slack pre- and post-2020, particularly for the lowest quintiles. As before, confidence intervals are large on the slack term after COVID.
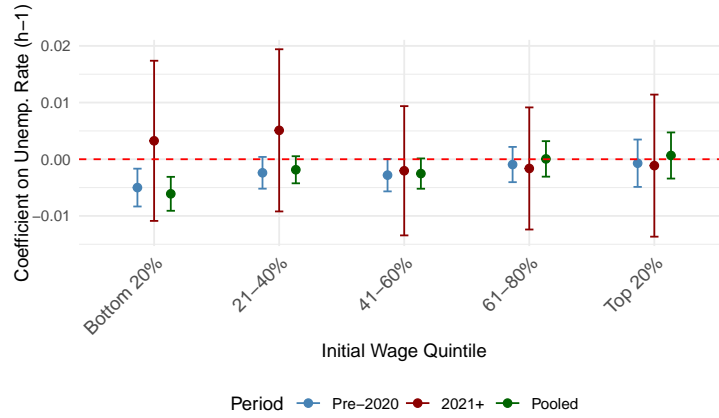


Figure 14: Estimates of equation 3, with Unemp. Rate

To check the robustness of the results in Figure 14 we explore the implications of an alternative measure of labour market conditions. In Figure 15, we estimate Equation 3 using 'tightness' as the key explanatory variable, following Autor et al.'s (2024) characterisation, with tightness reflecting the average in the negative standardised unemployment rate and standardised employment-to-employment separations rate.[39] Using this measure rather than the unemployment rate, we find broadly consistent results with our earlier analysis.

For a final set of wage-Phillips estimates, a third estimation procedure uses the change in log nominal hourly earnings for the individual as a dependent variable and the state unemployment rate as an explanatory variable, to analyse cyclical fluctuations in nominal wage dynamics by education attainment:

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[39]We calculate the latter using Longitudinal Employer-Household Dynamics measures of 'separations from stable employment followed by a hire to stable employment with no observed nonemployment spell', normalised by the labour force.

Figure 15: Estimates of equation 3, with 'Tightness'

$$\Delta_{12-month} \ln(Wage_{ist}) = \beta_1 UnempRate_{sh-1} + \beta_2 College_{ist}$$
$$+ \beta_3(UnempRate_{sh-1} \times College_{ist})$$
$$+ \beta_4 X_{it} + \beta_5 Z_i + \alpha_s + \lambda_h + \varepsilon_{ist}$$
$$(4)$$

Where $\Delta \ln(Wage_{ist})$ is the twelve-month change in log hourly earnings for individual $i$ in state $s$ at month $t$, $UnempRate_{sh-1}$ is the st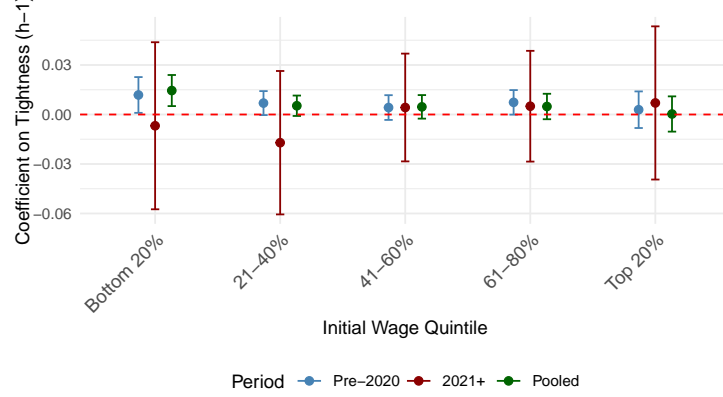ate average unemployment rate in the half-year that immediately precedes the half-year month $t$ is in, measured in percent, $College_{ist}$ is a dummy for whether individual $i$ has at least a BA, $X_{it}$ and $Z_i$ capture individual-level demographic controls (including age, age-squared, gender, race, and union membership), $\alpha_s$ give state fixed effects, $\lambda_h$ gives half-year fixed effects, and $\varepsilon_{ist}$ is the error term. Standard errors are clustered at the state level. Importantly, any month an individual has an earnings observation for is matched to a corresponding half-year.

Estimating this model generates information on how the unemployment rate is associated with hourly wage dynamics during different phases of the pandemic, with particular focus on differential effects between those with and without a college degree. In particular, the model allows us to draw some conclusions regarding the effect of the unemployment rate (in the previous half-year) as a measure of labour market conditions, on individual earnings while controlling for various individual factors, as well as accounting for state fixed effects and time shocks.

We hypothesise that an increase in unemployment benefits and cash transfers during the pandemic boosted nominal wage growth, particularly at the bot-

tom of the wage distribution, where non-college workers are to a large extent over represented. Thus, we expect uniform federal supplementary benefits to be found as a factor positively influencing nominal wage dynamics in all states, showing up as a time fixed effect in the estimates, that the effect will be especially strong in states with high unemployment, and that there will be a decline in the coefficients on both the college dummy and the college and unemployment interaction term. A sub-period coefficient stability analysis is included to capture these associations and provided in Table 2 and Table 3.

Our sub-period analysis in Table 2 shows evidence for a generalised wage-Phillips curve in the period from 2000-2019, but no statistically significant association over the 2020-2025 period; although it should be noted that the absolute value on the standalone unemployment rate term is considerably larger. Excluding 2020 from the post-pandemic period[40], Table 3 shows a *positive* (but statistically insignificant) association between the unemployment rate and nominal wage growth for the 2021-2025 period. Comparing pre-2020 with our pooled data, in both tables we see a fall in the coefficient on the college dummy. Across all periods, we find some evidence in line with a positive relationship between labour market slack and wage inequality by educational attainment (column 3, row 3 of Table 2).[41]

Our interpretation of these findings is that unusual post-COVID policies in the initial post-pandemic period, like unemployment insurance with exceptionally high replacement rates, have been a significant driver of the recent nominal wage growth, irrespective of educational attainment; policies like robust unemployment insurance have the potential to confound traditional wage-Phillips estimations.[42] Excluding 2020 from the data and looking at the period after COVID, the returns to college education have been negatively associated with the degree of labour market slack (column 2, row 3 of Table 3.) This evidence may be grounds for some caution over the hypothesis that tight labour markets have driven the recent compression – at least using educational attainment as a relevant dimension.

The evidence in Table 2- Table 3 is broadly in line with our expectations, however, the insignificant results in the third row of column 2 in both Table 2 and Table 3 call for a more direct study of the wage distribution than analysis of Equation 1 allows, and preferably with more granularity concerning different phases of the post-COVID period.

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[40]Since we use a half-year lag of the unemployment rate as a regressor, it should be noted that the analysis of 2020 wage growth includes also economic conditions prior to the pandemic as an explanatory variable.

[41]This association just misses statistical significance at the 10% level when excluding 2020 from the data; see column 3, row 3 of Table 3 and note that coefficients and standard errors are rounded to three decimal points.

[42]This observation may have more general implications for attempts to capture the wage-Phillips relation, in an era characterised by the stronger presence of automatic stabilisers than during the period analysed by Phillips (1958).

Table 2: Estimates of equation 4, including 2020 data

| | *Dependent variable:* | | |
|---|---|---|---|
| | Δ Log Hourly Earnings | | |
| | Pre-2020 | 2020+ | Pooled |
| | (1) | (2) | (3) |
| Unemp. Rate (h-1) | −0.002*** | −0.004 | −0.002*** |
| | (0.001) | (0.003) | (0.001) |
| College Educated | 0.014*** | −0.003 | 0.010*** |
| | (0.003) | (0.008) | (0.003) |
| Unemp. Rate (h-1) × College Ed. | 0.0002 | 0.002 | 0.001* |
| | (0.0004) | (0.002) | (0.0004) |
| State Fixed Effects | Yes | Yes | Yes |
| Half-Year Fixed Effects | Yes | Yes | Yes |
| Clustered SE | State | State | State |
| Observations | 745,553 | 117,240 | 862,793 |

*p<0.1; **p<0.05; ***p<0.01. Note: CPS data 2000-2023, public
and private sector employees aged 16-65, 35+ hours/week, weekly
earnings above federal minimum wage threshold and below $2,885.
State unemployment data from the BLS.

Table 3: Estimates of equation 4, excluding 2020 data

| | *Dependent variable:* | | |
|---|---|---|---|
| | Δ Log Hourly Earnings | | |
| | Pre-2020 | 2021+ | Pooled |
| | (1) | (2) | (3) |
| Unemp. Rate (h-1) | −0.002*** | 0.001 | −0.002*** |
| | (0.001) | (0.004) | (0.001) |
| College Educated | 0.014*** | 0.005 | 0.011*** |
| | (0.003) | (0.010) | (0.002) |
| Unemp. Rate (h-1) × College Ed. | 0.0002 | −0.0004 | 0.001 |
| | (0.0004) | (0.002) | (0.0004) |
| State Fixed Effects | Yes | Yes | Yes |
| Half-Year Fixed Effects | Yes | Yes | Yes |
| Clustered SE | State | State | State |
| Observations | 745,553 | 85,377 | 830,930 |

*p<0.1; **p<0.05; ***p<0.01. Note: CPS data 2000-2023, public
and private sector employees aged 16-65, 35+ hours/week, weekly
earnings above federal minimum wage threshold and below $2,885.
State unemployment data from the BLS.

Summarising the findings in this section, the recent discussion on wage-inequality in the US after COVID has emphasised that wage-Phillips curves have steepened post-pandemic. Two pieces of evidence presented here contrast with this characterisation. Table 2 and Table 3 suggest that there is a *general*, i.e., across all periods after 2000, negative association between labour market conditions and nominal wage growth. However, a sub-period analysis for the period from 2020-2023 or from 2021-2023 is less conclusive; in fact, with respect to the latter period, Table 3 suggests a reversal in the sign on the association between slack and wage growth – although the coefficient is not statistically significant. The role of labour market conditions in nominal wage dynamics correspondingly appears to have changed much within the post-pandemic period, and composition of the policy response is (in our assessment) a relevant part of the story.

In terms of caveats to the findings above, for the individual-level estimates, one potential source of bias to the significance of the results, also discussed in Blanchflower and Oswald (1995), concerns the higher level of aggregation on the key explanatory variable than that of the dependent variable, which may lead to underestimates of the standard errors.[43]

The estimates provided in Table 1 and Figure 14-Figure 15 analyse a dependent variable measured at the same level (the state level), and as a result the aforementioned caution need not apply. Across the distinct levels of aggregation, estimation procedures, and explanatory variables, the findings presented in this section broadly seem compatible with each other and consistent with a hypothesis emphasising the *sui generis* character of the recent compression.

# 5 Policy issues

## 5.1 Long-run implications of tightness

If the general tightness of the labour market is seen as the main source of the recent compression, expansionary aggregate demand policy and tight labour markets would seem to offer a relatively simple way to sustain and maybe enhance the reduction in wage inequality.[44] Theoretical frameworks (including

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[43]See Moulton (1990) for a corresponding characterisation of potential challenges to such an estimation method. However, a large literature has assessed the Blanchflower and Oswald methodology favourably. In a review, Card (1995) suggests Blanchard and Oswald's so-called 'wage curve' approaches an "empirical law of economics." Meanwhile, Nijkamp and Poot (2005) conduct a meta analysis, finding consistent results accounting for publication bias.

[44]This appears to be the policy conclusion drawn by Autor *et al.* (2024). They describe their analysis as focusing "on how macroreconomic shocks that amplify labor market tightness yield aggregate wage compression" (p. 33.) Dube (2024) also highlights the role of expansionary macroeconomic policy, arguing that their findings

> point to the importance of policies aimed at enhancing tightness during this period and underscore the effectiveness of the administration's macroeconomic approach

and that

the search and matching framework) that generate a natural rate of unemployment render it impossible, however, for aggregate demand policy to influence the tightness of the aggregate labour market in the long run without sparking explosive inflation. To get around this problem, one might modify the policy advice, focusing instead on increasing the tightness of low-wage sectors through an expansion of the share of demand going to these sectors. But if supply-demand balances for workers with different skills lie behind the inequality, a tightness-induced compression would be associated with an employment shift from high- to low-wage sectors – not, one would think, a desirable result. Rather than shifting demand towards low-wage jobs, one would presumably want to shift the supply of labour from low- to the high-wage sectors. From this perspective an educational strategy would seem more promising.[45]

The natural rate of unemployment hypothesis should be rejected on both behavioural and empirical grounds. Both employment and the wage distribution are undoubtedly subject to hysteresis which, in principle, could create space for sustained labour market tightness to compress inequality as well as reduce the profit markup and raise real wages. But there are upper bounds on the range of feasible employment rates, even if the exact location of these bounds is uncertain.[46] [47] It is not obvious, furthermore, that tight labour markets and high rates of wage inflation will tend to raise the real wage. The tightness could put a damper on firms' investment and hiring decisions,[48] leading to demand being met by a rise in the markup rather than by an increase in output.

## 5.2  Bidenomics

The successes of Bidenomics have been extolled by influential commentators. Our economy "Isn't 'Goldilocks'. It's better", Paul Krugman suggested. Inflation was back down close to 2 percent without a recession, employment cre-

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policies promoting full employment – such as those pursued by this administration – have been crucial in fostering wage growth and reducing pay disparities.

[45]This was the policy advocated by Goldin and Katz (2008), among others, as a response to skill-biased technological change. It should be noted, however, if inequality has risen primarily as a result of power-biased institutional and technological change (Skott and Guy (2007), Skott (2023), chapter 7), education can do little to bring down inequality.

[46]Aggregate demand policy should aim for employment rates close to but below the upper bound; a Keynesian 'full employment target' should be interpreted in this way.

[47]In an open economy, a rise in nominal wages can clearly squeeze profit margins if the exchange rate fails to adjust and domestic firms face increasing competition from foreign producers. A deterioration of the balance of payments is likely to limit the magnitude and sustainability of this distributional effect, especially in smaller economies; the US represents a somewhat special case due to its size and the role of the US dollar in international trade.

[48]Although the sign on this relation is not *a priori* clear. Ugurlu and Aboobaker (2025) explore this question with survey data for a panel of 13 manufacturing industries within 17 European countries, surprisingly finding a robust positive association between labour shortages and investment.

ation had been amazing during the Biden years, there had been strong GDP growth, and real wages had increased, with low wage workers benefiting the most. America had outperformed its peers "in part because Biden's spending boosted growth and employment" ((NYT Feb 1, 2024) These policies also lay behind the compression which, following Autor et al. (2024, was explained by Krugman as mainly the result of a tight labour market: "Full employment greatly increases workers' bargaining power" (NYT, Jan 15, 2024.)

Despite this economic record, many people expressed negative views on the Biden economy during the 2024 presidential campaign, and the Democrats have been losing support, especially among low income groups, eventually losing the election.[49] Krugman has explained this puzzle as a reflection of partisanship: "what people say about the economy reflects what they hear, either from news organizations or on social media, rather than their own experiences" (NYT Nov 14, 2023.)

Partisanship undoubtedly plays a role in people's perceptions of economic performance, but Krugman paints a picture that is misleading in important respects.[50] It is correct that real wages increased for most groups between 2019 and 2024, and that there was a substantial compression of inequality over this period. But neither was due to a tight labour market created by expansionary fiscal measures during Biden's presidency. Much of the compression and the real wage growth happened in 2020 and 2021 when the overall labour market was relatively slack. And Biden clearly cannot be given credit for developments before he took office in January 2021.

Breaking down the population by age and education, the data in Autor *et al.* (2024) show that workers under 40 with only a high school degree had an hourly real wage approximately 1 percent higher in June 2023 than in January 2021, but they still received a real wage below the level associated with the pre-pandemic trend. And in June 2023 the real wages of workers with at least a BA and of workers of age 40 and above with less than a BA were about 2 and 5 percent below their respective levels in January 2021 (Autor *et al.* (2024), figure 10.)

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[49]The pollster Adam Carlson's measure of the change in support between the 2020 election and June 2024 polls (prior to Biden dropping out of the race) suggested that Republicans had gained over 4 percentage points among white non-college voters, over 8 percentage points among non-college voters, and over 11 percentage points on those earning less than $50,000. Silver (2024) has also presented data from exit polls that show a long-term decline in Democrats' support among low income groups, and if polling data from March 2024 were correct Republicans would take a majority of low-income voters for the first time in several decades.

[50]Krugman is not alone. In an open letter sixteen Nobel laureates suggested that:

"During Joe Biden's presidency we have also seen a remarkably strong and equitable labour market recovery – enabled by his pandemic stimulus. An additional four years of Joe Biden's presidency would allow him to continue supporting an inclusive U.S. economic recovery."

https://www.documentcloud.org/documents/24777566-nobel-letter-final.
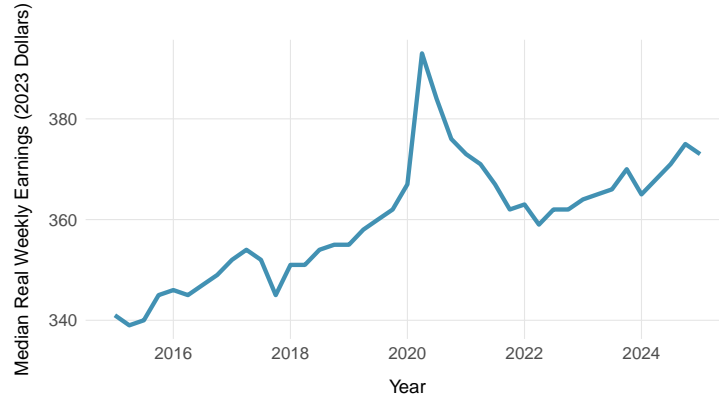
Figure 16: Median real weekly earnings

[51] Similar conclusions apply with respect to the trajectories of real wages by percentile (Autor et al. 2024, figures 29 and A3), and the picture is no different using BLS data. Neither the median weekly real earnings of full-time employees nor the average real wage of nonsupervisory workers was significantly higher in the at the time of the election in November 2024 than when Biden took office. During the first Trump presidency, by contrast, real wages rose significantly; see Figure 15 and Figure 16.

With real wage growth that had been weak (at best), increasing profits and a surge of inflation we do not have to rely on partisanship to account for the Democrats' loss of support from the working class.[52]

## 5.3 Price setting and inflation

The real wage is not determined exclusively in the labour market but through the interaction between wage and price setting, with the latter significantly

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[51]Autor et al. (2024, p. 1) note that

> A key fact motivating our inquiry is that both real and relative wages have grown substantially more at the bottom of the distribution (10th percentile) than at the median or top (90th percentile) since the onset of the pandemic.

An alternative description of the findings in their Figure 1 could be that real wages at the 10th percentile have continued roughly on their pre-pandemic trend, while real pay at the median and top of the wage distribution has been significantly below pre-pandemic trends.

[52]Stantcheva (2024) presents interesting survey evidence that 'Biden and the administration' is the leading explanation for high inflation among survey respondents in all income groups (in open-ended text responses), but particularly those earning below $40,000. This is the case despite the survey including multiple other categories of response related to policy, including 'fiscal policy', 'war and foreign policy', 'demand side mechanisms', and 'government debt'.
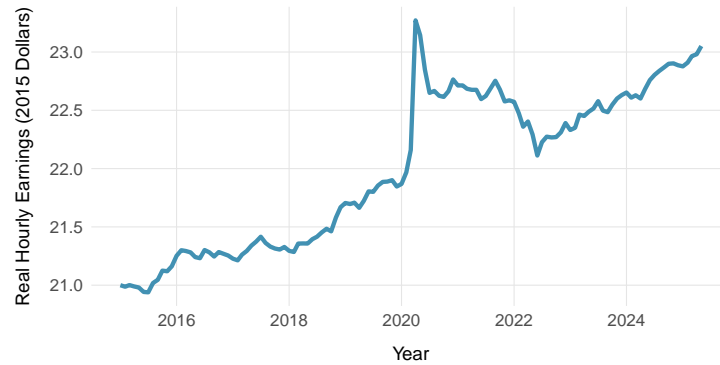
Figure 17: Average hourly real nonsupervisory earnings

influenced by the state of the goods market. The shift in the functional distribution towards profits since 2020 exemplifies the importance of this interaction (Figure 18).

Prominent discussions of the increase in the profit share have emphasised corporate greed, with corporations using the pandemic and the supply chain disruptions as cover for raising their profit margins.[53] There is no doubt that corporations are greedy – this is what profit maximization means. Deregulation, the increasing acceptance since the 1980s of shareholder value as the exclusive performance criterion, and performance-based remuneration of top management may have made the pursuit of profits more ruthless over the last 40 years, and it is also likely that the pandemic and the public awareness of supply constraints may have reduced the adverse reaction of consumers to price increases, rendering managers less worried about competitors taking advantage of their price increases. Having said this, however, to a large extent the post-pandemic price increases likely reflected price flexibility in the face of supply constraints.[54]

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[53]Weber and Wasner (2023). Other broadly post-Keynesian discussions of the recent inflation have stressed other factors; e.g., Wildauer *et al.* (2023) and Lavoie (2024),

[54]As argued in Skott (1989; 2023, chapter 10), both post-Keynesians and new-Keynesians underestimate the degree of price flexibility. Auto makers were able to sell their cars at list price, with many dealers adding an additional margin on list price, and the combined profits of GM, Ford and Stellantis surged from $20 billion in 2020 to $37 billion in 2022 (Hersh 2023). But the supply of cars was not held back deliberately by scheming managers: the supply was limited because domestic and international supply disruptions made them unable to increase production. And although car prices increased, they did not rise enough to clear the market: inventories dropped by 85 percent between January 2020 and January 2022, pre-ordering cars became the norm, and car buyers sometimes had to wait many months for delivery. The influence of demand forces also showed up in industries that experienced falling demand: airline tickets dropped by about 35 percent when the pandemic hit and demand
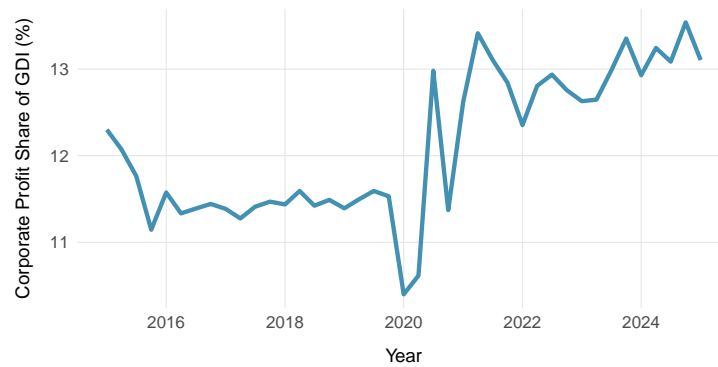
Source: Federal Reserve Economic Data (FRED) | Series: CPROFIT as percentage of GDI

Figure 18: Profit share

The fluctuations of prices and profit margins take place around benchmark levels that are influenced by structural characteristics, including firms' monopoly and monopsony power. These characteristics may be affected by changes in, *inter alia*, technology, labour market institutions, domestic regulation and trade policies. If, for simplicity, the benchmark profit margin and profit share are taken as exogenous and constant, the average real wage becomes independent of nominal wages; the struggle for higher nominal wages now determines the wage distribution. Workers that obtain large wage increases gain at the expense of those with a weak bargaining position and low wage increases; the wage struggle favours the strong. This conclusion applies to non-unionized labour markets as well as to economies with fragmented unions, each bargaining exclusively to advance the narrow interests of its own members.

The implications of tight labour markets are not obvious in this context. A strike by auto workers at Ford, General Motors, and Stellantis in 2023 won wage increases ranging from 33 percent to 160 percent over the life of their contracts[55]. This outcome has been hailed as a historic victory for US workers, but if average profit margins remain unchanged, the effect could be a squeeze on relative and real wages in other sectors, many of whom with lower paying jobs.[56]

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plummeted, before rising steeply when demand came back in the second half of 2022 and the airlines scrambled to find pilots.

[55]See https://uaw.org/uaw-members-ratify-historic-contracts-at-ford-gm-and-stellantis/)

[56]The issues take a slightly different form for workers in the public sector. Public services in other areas may be cut or taxes raised if strong wage gains for professors at state universities are financed by higher state grants.

The evidence shows that unionisation tends to reduce wage inequality.[57] The effect is stronger in economies with centralised unions, however, and it may be a mistake for progressives to cheer strikes and generous contracts if the gains go to groups that are already highly paid. Yes, the nominal wage increases for the strong are likely to produce a cascade of nominal wage increases for weaker groups, but if the proportionate increases are smaller than for the well-paid groups and average markups are unchanged, the result will be greater inequality and lower real wages for the weak. The same proportionate nominal wage increases for all groups leave relative and real wages unchanged but leads to inflation.

## 5.4   Lessons

A tight-labour-market strategy and rapid nominal wage growth as the main routes to greater income equality must be rejected if expansionary aggregate demand policy generate (potentially explosive) inflation and uncertain distributional outcomes.[58] An alternative approach, articulated explicitly by the Swedish Rehn-Meidner plan (Meidner and Rehn 1953), has influenced union strategies and economic policies in the Nordic countries.[59]

In the Rehn-Meidner vision, reconciling tight labour markets with low inflation and wage compression requires institutions like centralised, solidaristic wage bargaining, as well as active labour market policies to facilitate the mobility of workers from low-wage jobs to sectors and firms with higher productivity and wages. As outlined by Rehn and Meidner, full employment does not in and of itself generate compression of the wage distribution. Furthermore, wage restraint may be called for to avoid inflation and the erosion of competitiveness of sectors that are exposed to international trade. The power that comes from high employment rates should be channelled into securing political and institutional changes to benefit workers instead of into fighting for increasing average nominal wages.

Full employment was seen as posing a threat to progressive priorities in the absence of these institutions. According to Meidner (1993), the weakening of the Swedish model after the 1970s was in large part the result of a failure of aggregate demand policy to follow these guidelines:[60] [61]

> [t]he essence of the Swedish Model, as outlined in the report to

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[57]See Pontusson (2013), Freeman (1988), Wallerstein (1999).

[58]Other qualifications on the usefulness of aggressive aggregate demand policy to economic development and tackling entrenched interests are addressed in Aboobaker and Ugurlu (2023).

[59]See Erixon (2018) and Erixon (2010) for an extended account of the Rehn-Meidner model.

[60]It should acknowledged that other centrifugal forces also contributed to a weakening of both unions and the degree of centralisation in the Nordic countries.

[61]See also Silverman et al. (1980, pp. 43-44) for Myrdal's views on how full employment accorded with the Rehn-Meidner vision.

the 1951 LO Convention, was the notion that full employment and economic stability could be made compatible. We argued that anti-inflationary full employment policy had to be based on two pillars: a restrictive general economic policy which does not guarantee full employment, and selective labour market policy measures which absorb redundant labour. Swedish governments have frequently neglected the first part of the recommendation and tolerated periods of excess demand in the product and labour markets... To ensure economic stability and to combat inflation is the responsibility of the national government – but the government had neither the courage nor the strength to play this role. Gunnar Myrdal's warnings [that inflation poses a deadly threat to socialism; AA and PS] came true: inflation mercilessly undermined the basis of the Swedish Model.

The Swedish economy was highly unionised with strong centralisation when Gösta Rehn and Rudolf Meidner presented their report in 1951. The current situation in the US is quite different, and the relevance of the Nordic experience for the labour movement in the US may seem tenuous.

To gain credibility and expand the membership, weak and fragmented unions will undoubtedly have to fight for the immediate interests of their members, giving a high priority to wages. But in retrospect the deliberate choice by AFL leaders during the early phases of American labour unions to pursue a 'pure and simple unionism' may have been a mistake.[62] By adopting an agenda focused on wages and working conditions while eschewing broader political issues and involvement with national political organizations, the strategic orientation of the American labour movement became quite different from that of many European counterparts. This may have been costly.

Without legislative and institutional reforms, the recent compression is unlikely to last. The wage distribution, like employment, may be subject to hysteresis, and the erosion of the relative position of low-wage workers is likely to happen gradually. But a palette of policy interventions will be needed to lock it in and avoid erosion.

A radical increase in federal minimum wages with rules that adjust the minimum in line with prices (or the average wage) could have a big impact. A short list of other interventions includes improved unemployment benefits, regulatory changes that facilitate unionisation, the enforcement of measures to prevent the evasion of labour market regulations by the use of gig workers and franchises, and breaking up firms with a dominant monopoly or monopsony positions.[63]

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[62]See https://aflcio.org/about/history/labour-history-people/samuel-gompers for a brief presentation of the views of Samuel Gompers, the leader of the AFL for nearly 40 years from its formation in 1886. Domhoff (2013) provides an interesting overview of the history of US labour unions.

[63]See Callaci (2021), Callaci and Vaheesan (2023), Callaci *et al.* (forthcoming) for further discussion of related issues.

Broader reforms would be at least as important. Universal, publicly financed health insurance would eliminate the monopsony effects of employment-based health plans (in addition to other more commonly discussed benefits), while increased child support and a general strengthening of the social safety net would reduce the stress and anxiety of low- and middle-income households.

Unlike the power-biased fiscal packages of the pandemic, many of these structural changes have limited short-term effects. They are crucial for the long term, however. The labour movement in many European economies, most notably the Nordic countries, succeeded in creating affluent societies with an extensive social safety net and relatively low levels of social and economic inequality. Strong unions, with general strikes as the ultimate weapon, used their power to push for broader political and institutional change. The push sometimes took the form of social pacts, with labour unions agreeing to wage restraint in return for legislative progress on other issues. Arguably more important, but less visible, the organized labour movement played a crucial role in shaping public opinion through various forms of outreach and education, including affiliated newspapers.[64]

Labour-friendly change in the US will be met by fierce opposition, and substantial progress will require strong political pressure and powerful alliances. Labour unions will be crucial in this respect, but to perform this role a break with 'pure and simple unionism' will be needed. While attending to pressing needs and immediate priorities of their current memberships, unions must coordinate and increase their efforts towards advancing broader goals.[65]

# 6    Conclusion

The COVID pandemic and the ensuing policy intervention can be seen as exogenous shocks that potentially offer valuable policy lessons. One reading of this period has highlighted a tight labour market as the key source of large wage gains at the low end of the income distribution, and some wage compression during expansions is in line with the general cyclical pattern. While this reading is buttressed by a series of interesting statistical findings, it is hard to square with three somewhat intuitive observations: 1) the magnitude of the compression cannot be explained by a tight labour market alone, 2) hourly real

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[64]Biden should get credit for his efforts to support organised labour. The National Labor Relations Board (NLRB) was strengthened, for instance, with increased funding and the appointment of experienced labour advocates to the board (Rhinehart *et al.* 2024). Embarrassing levels of disorganisation (or a degree of cynicism) have led to the ceding of a progressive majority on the NLRB just as Republicans take over the presidency (Zhang 2025).

[65]As a recent step in this direction, the AFL and SEIU reunited in January 2025 in order for the labour movement "to challenge the status quo and build a movement of workers who will fight—on the job, in the streets, at the ballot box, in our communities— for higher pay, expanded benefits and new rules that empower them to join together in unions and organize across industries" (https://aflcio.org/press/releases/seiu-joins-afl-cio-build-unprecedented-worker-power-win-unions-all-workers.)

wages for workers with lower levels of educational attainment (those with less than a BA) were by 2023 at or below their 2015-2019 trend, and 3) the timing of a tightness-centered story is off; a large part of the compression happened during the first half of 2021 when all standard measures of tightness were low.

The tightness argument is also hard to reconcile with our econometric findings. While we found some support for the presence of a wage-Phillips relationship in a form that appears particularly strong for groups at the lower end of the earnings distribution, this relationship is not statistically significant or with the expected sign in the period after COVID in our econometric exercises. This leads us to the conclusion that, yes, there may be reasons to believe that cyclical compression of the wage distribution exists, but both the evidence and more general behavioural considerations suggest that the composition of the policy response to the pandemic may have provided a boost to low-wage workers' income, wage aspirations, and power. In particular, significant transfers to low-income households during COVID, in the form of unemployment insurance and stimulus checks, may confound traditional measures of the wage-Phillips curve; our findings highlight unusual aspects of the recent compression that are unrelated to general cyclical factors. The composition of the pandemic fiscal packages represented a break with past policy trends: the policy intervention was power-biased and, unusually, the power bias was in favour of low-wage workers.

The broad, bipartisan support behind most of the fiscal interventions makes this power bias all the more surprising. One can speculate that the power biases in favour of low-income groups may have been related to time pressures, the obvious political need to 'do something', and an administrative inability to tailor measures less crudely. Or perhaps politicians simply got carried away by their own rhetoric about 'hero workers'. Whatever the explanation, in our reading, the pandemic experience shows the importance of selective interventions that affect the power balances. The pandemic policy packages boosted aggregate demand, but the main source of wage compression plausibly derived from the power biases of the packages and from pandemic-induced turbulence and sectoral shocks. The packages achieved the compression through a radical increase in unemployment benefits and a general improvement in the financial position of low-income households.

The recent period also illustrates how inequality measures can move in different directions. Wage inequality fell but there were increases in both the profit share and the pre-tax income inequality. In general, expansionary aggregate demand policies that raise employment rates and reduce wage inequality may simultaneously raise profit shares and have ambiguous total effects. Any positive real-wage effects from expansionary policies and tight labour markets, moreover, would be mediated by rising nominal wages, with associated inflationary pressures and the risk of backlash.[66] Fortunately, a wider menu of distributional

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[66]Skott (2025) discusses these issues in greater detail.

policies are available; addressing inequality need not be reduced to boosting aggregate demand.

To be clear, the argument in this paper is not that aggregate demand policy and the tightness of labour markets cannot influence income distribution. There are many reasons to question the existence of a well-defined natural rate of unemployment, and sustained periods of high employment will shift the balance of power, with potential effects on wage and price setting. But the overall effects of a pure wage struggle on the distribution of income are ambiguous, and rising nominal wages easily lead to increasing inflation, contractionary policy and a reversal of earlier gains – including through shifts in political balances of forces.

The likelihood of sustained improvements towards a more equal society is enhanced if the shift in power relations associated with high employment is channeled into fighting for institutional changes and a labour voice in political affairs, rather than towards raising nominal wages.

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