

The Productivity-Median Compensation Gap in the United States: The Contribution of Increased Wage Inequality and the Role of Policy Choices

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Abstract

This article offers a narrative and supporting evidence on mechanisms that suppressed wage growth and generated a divergence of 43 percentage points (1.05 points per year) between net productivity and median hourly compensation growth between 1979 and 2017 in the United States. These dynamics reflect the strengthening of employers' power relative to white-collar and blue-collar workers. We offer empirical assessments of the impact of particular factors on wage growth and wage inequality. The three factors with the largest and best measurement impacts, i.e., excessive unemployment, eroded collective bargaining, and corporate-driven globalization — explain 55 per cent of the divergence. Other factors — a diminished overtime salary threshold, employee misclassification, employer-imposed non-compete agreements, and corporate fissuring-subcontracting and major-buyer dominance — explain another 20 per cent. Together, these policy-related factors can account for three-fourths of the 1979-2017 divergence between productivity and median hourly compensation growth.

Inequalities abound in the U.S. economy. A central driver of these inequalities in recent decades has been the widening gap between the hourly compensation of a typical (median) worker and labour productivity—the income generated per hour of

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work. This growing divergence has been driven by two other widening gaps, that between the compensation received by the vast majority of workers and those at the top of the wage distribution, and that between labour's and capital's share of income. This article presents an updated account of the United States productivity-pay divergence (Mishel and Gee 2012) and evidence that the divorce between the growth of median compensation and productivity has been generated primarily through intentional policy decisions designed to suppress typical workers' wage growth, namely the failure to improve and update existing policies, and the failure to thwart new corporate practices and structures aimed at wage suppression. Inequality will stop rising, and paychecks for typical workers will start increasing robustly in line with productivity, only when we enforce labour standards and embrace policies that reestablish individual and collective bargaining power for workers.

Between 1979 and 2017, the compensation of median workers trailed economy-wide (net) productivity growth by roughly 43 percentage points, or 1.05 percentage points per year. The effects have been felt broadly: During this time 90 per cent of U.S. workers experienced wage growth slower than the economy-wide average (0.99 per cent), while workers at the top (mostly highly credentialed profession-

als and corporate managers) and owners of capital reaped large rewards made possible only by this anemic wage growth for the bottom 90 per cent.

Sluggish median wage growth is not a political secret; it has been widely recognized across the political spectrum, even cited by both the Republican and Democratic Party platforms in 2016.² The root causes of the trend have frequently been misidentified, however. One prominent interpretation is that disappointing wage growth is an unfortunate result of apolitical market forces that one neither can nor would want to alter. Since labour markets are generally competitive and workers and employers have roughly balanced degrees of market power, this argument assumes, fundamental apolitical forces like technological change and automation, as well as globalization, have mechanically shifted demand away from non-college-educated and middle-wage workers. But the premier research cited in support of a competitive market-based explanation — predominantly focused on automation/technological change since the impact of globalization is frequently (though wrongly) considered to be minimal— has itself actually offered empirical metrics that demonstrate that automation/technological change fails to explain wage trends and wage inequality, especially in the period since 1995 (Mishel and Bivens

2 The Republican Party platform reads: "Our economy has become unnecessarily weak with stagnant wages. People living paycheck to paycheck are struggling, sacrificing, and suffering." The Democratic platform reads: "But too many Americans have been left out and left behind. They are working longer hours with less security. Wages have barely budged and the racial wealth gap remains wide, while the cost of everything from childcare to a college education has continued to rise." See <https://www.presidency.ucsb.edu/documents/2016-republican-party-platform>, and <https://www.presidency.ucsb.edu/documents/2016-democratic-party-platform>

2021b).

We need to look further for more convincing empirical explanations of why, during a period of rising productivity, hourly compensation for the bottom 90 per cent of all workers has risen so slowly in spite of overall income growth. Doing so requires explaining the key dynamics. The growing wedge between rising productivity and compensation growth for the typical worker financed the increased share of compensation going to top earners, especially those in the top 1 per cent and 0.1 per cent, along with a declining share of income going to labour. In addition, over the last four decades there has been a persistent disparity in the growth of earnings between those in the 90–99 per cent range and those in the middle. Further, wage disparities by gender, race, and ethnicity from the late 1970s, reflecting institutionalized gender and race discrimination, remain with us and have sometimes even worsened. Any accounting of where we are and what policies we need must address these issues.

This article offers a narrative and supporting evidence on the mechanisms that have suppressed wage growth since the late 1970s. We refer in this analysis to wage suppression rather than wage stagnation because it was an actively sought outcome — engineered by policymakers who invited and enabled capital owners and business managers to assault the leverage and bargaining power of typical workers, with the inevitable result that those at the top claim a larger share of income.

Six factors can collectively explain most of the growth of wage inequality and the erosion of labour’s share that resulted in wage suppression over the last four decades

(specifically 1979–2017):

- Austerity macroeconomics, including facilitating unemployment higher than it needed to be to keep inflation in check, and responding to recessions with insufficient force;
- Corporate-driven globalization, resulting from policy choices, largely at the behest of multinational corporations, that undercut wages and job security of non-college-educated workers while protecting profits and the pay of business managers and professionals;
- Purposely eroded collective bargaining, resulting from judicial decisions, and policy choices that invited ever more aggressive anti-union business practices;
- Weaker labour standards, including a declining minimum wage, eroded overtime protections, nonenforcement against instances of “wage theft,” or discrimination based on gender, race, and/or ethnicity;
- New employer-imposed contract terms, such as agreements not to compete after leaving employment and to submit to forced private and individualized arbitration of grievances; and
- Shifts in corporate structures, resulting from fissuring (or domestic outsourcing), industry deregulation, privatization, buyer dominance affecting entire supply chains, and increases in the concentration of employers.

Concretely, our analysis attempts to account for the 43 percentage point (1.05 points per year) divergence between the growth of labour productivity (net of depreciation) and median hourly compensa-

tion (wage and benefit) growth between 1979 and 2017. This wedge excludes any impact of the differing measures of prices used to inflation-adjust productivity and compensation growth. Had median hourly compensation grown with net productivity it would have increased from \$20.48 in 1979 to \$33.10 in 2017 (2019\$). In fact, median hourly compensation was \$23.15 in 2017, a \$9.95 shortfall from the net productivity benchmark.

We estimate that the first three factors—the impacts that are largest and best measured, i.e., excessive unemployment, eroded collective bargaining, and corporate-driven globalization—explain 55 per cent of the divergence between growth in productivity and median hourly compensation, and specific other factors included above a diminished overtime salary threshold, employee misclassification, employer-imposed noncompete agreements, and corporate fissuring-subcontracting and major-buyer dominance—explain another 20 per cent. Together, the factors³ for which we have been able to assess their impact on the median wage can account for three-fourths of the divergence between productivity and median hourly compensation growth from 1979 to 2017.⁴

This article’s analysis complements and

points in the same direction as other recent research that has focused attention on worker power. For instance, Stansbury and Summers (2020) also argue that reduced worker power explains sluggish wage growth and a declining labour share of income. New empirical examinations of employer monopsony power have identified a growing (at least since the late 1990s) and pervasive employer ability to mark down wages from 20 per cent to 50 per cent and to exert more power over low-wage workers than others. This new monopsony literature provides a top-down empirical approach, estimating the aggregate potential employer power to suppress wages and then examining the contributing role of countervailing forces like unionization, high-pressure labour markets, and high values of minimum wages in explaining an aggregate net metric of employer power. In contrast, we provide a bottom-up empirical approach examining the impact of many specific factors and gauging their contribution to the overall divergence between productivity and median compensation growth.

Our research and other recent findings demonstrate that employer power is ubiquitous in labour markets, and that wages will be lower and wage growth suppressed absent institutions and policies that provide countervailing power.⁵ In other words,

3 Other factors that we have not been able to empirically assess—increased wage theft and weak enforcement, anti-poaching agreements, increased discrimination, forced arbitration agreements, guestworker programs, and increased prevalence of employer-created “lawless zones” in the labour market where workers are deprived of effective labour protections because of their immigration status—have also contributed to wage suppression.

4 The growth of the wage inequality in the bottom half, the 50/10 wage gap, has been shown to result primarily from excessive unemployment and the deterioration of the minimum wage (Mishel and Bivens, 2021a).

5 Joseph Stiglitz has long focused on power in markets, emphasizing both product market monopoly power and the weakening of employee power relative to employers. He recently provided an analysis similar to the framework of this article (Stiglitz, 2021).

employer power is a constant of modern labour markets, but what has changed over the past generation or two is the erosion of institutions and policies — high-pressure labour markets, robust enforcement, unions, and meaningful minimum wages — that once provided that countervailing power.

The article proceeds as follows. The first step is to examine the wage trends that any explanation of wage suppression needs to explain and elaborating and analyzing the productivity-median hourly compensation divergence we seek to explain. The second section briefly assesses the conventional explanation of “skill-biased technological change”—namely, rapid automation workers while many lack the skills necessary for modern production systems. The third section identifies the six factors, from excessive unemployment and eroded collective bargaining to shifts in corporate structures, that we believe much better explain wage suppression. The fourth section reviews how this article fits into the overall literature on wage inequality and draws on the estimated impact of the various factors to establish how much they explain the overall divergence between productivity and median hourly compensation. The fifth and final section concludes.

Wage Trends and Patterns to be Explained

There are three disparities in growth of wages by workers’ wage rankings that

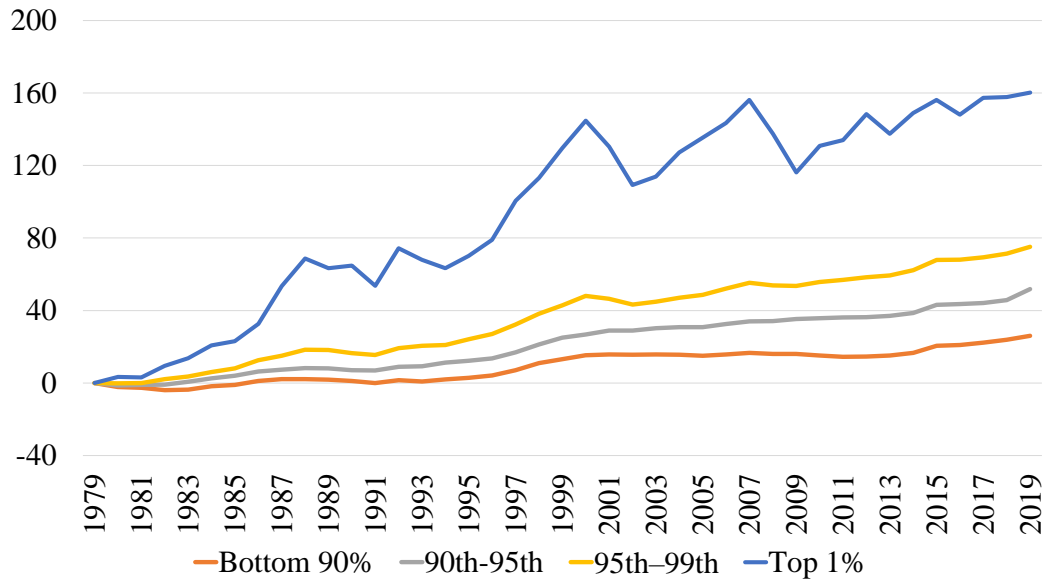
policymakers need to understand and economists need to explain: the one between the highest earners (the top 1 per cent and top 0.1 per cent) and other high-wage earners; the one between high-wage and middle-wage earners (the 95/50 or the 90/50 wage gaps); and the one between middle- and low-wage earners (the 50/10 wage gap). In addition, a theory about wage trends needs to explain the decline in the share of overall income accruing to labour, since this drop saps wage growth.

The rough summary of inflation-adjusted wage growth is as follows. Between 1979 and 2019 (the end of the last business cycle), inflation-adjusted annual wages at the very top have grown tremendously (Mishel and Kandra, 2020). Those in the top 1 per cent enjoyed 160 per cent growth (Chart 1), and those at the very top—the top 0.1 per cent—experienced growth of 345 per cent. Growth was much slower at the 95th percentile 63 per cent (using hourly wage data), slower still at the 50th (15 per cent), and a snail’s pace at the 10th (3 per cent) though it is worth noting that growth rates at the middle and the bottom were not remarkably different since the late 1980s.⁶

Two key wage gaps have grown since the late 1980s: the one between the top and very top on the one hand and all other earners, including even those at the 95th percentile, on the other, and the gap between high earners and middle earners, illustrated by the ratio of wages at the 95th (or 90th) percentile and the median wage.

⁶ Economic Policy Institute’s State of Working America Data Library. Wages by percentile and wage ratios <https://www.epi.org/data/?subject=wage-percentil>.

Chart 1: Cumulative Per Cent Change in Real Annual Wages, by Wage Group, 1979–2019



Source: EPI analysis of Kopczuk, Saez, and Song (2007, Table A3) and Social Security Administration wage statistics

The gap between the median earner and low-wage earners (50/10 wage gap) grew in the 1980s but has been stable since the 1987-88 (see Figures B and C in Mishel and Bivens 2021a).

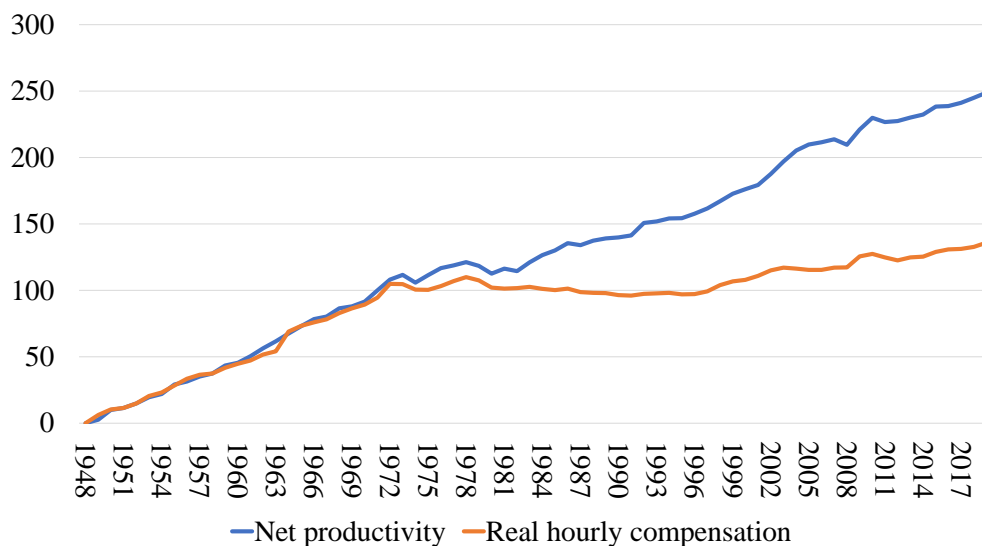
Decomposing the gap between productivity and median hourly compensation

The last four decades have seen a systematic divergence between the growth of economy-wide productivity (the amount of income generated in an average hour of work) and the growth of hourly compensation (wages and benefits) for typical workers. We proxy the wages of “typical” workers as either wages for nonsupervisory workers (roughly 80 per cent of the private-sector workforce) or wages for the worker earning the median wage. Chart 2 shows the growth of economy-wide productivity (net of depreciation, measured with

consumer prices) and the typical worker’s hourly compensation since 1948. It uses the hourly compensation of private production-nonsupervisory workers because that is the only series available for the entire period since 1948. While productivity and a typical worker’s compensation grew in tandem over the 1948-1979 period, they diverged thereafter, splitting entirely after 1979. In the latter period productivity growth decelerated significantly, but much more rapid deceleration (or even stagnation) occurred in growth of a typical worker’s compensation. Net productivity grew 118.4 per cent from 1948 to 1979, accompanied by 107.5 per cent growth in a typical worker’s compensation between 1979 and 2019 net productivity grew 59.7 per cent (1.18 per cent annually) further, but a typical worker’s compensation (wages and benefits) grew only by 13.7 per cent (0.38 per cent annually).

This divergence was first pointed out

Chart 2: Gap Between labour Productivity and a Typical Worker’s Compensation, 1948-2019



Source:

in the early 1990s (Mishel and Bernstein, 1994) to demonstrate that stagnant wages for the typical worker over the previous decade or so could not be explained solely by the slowdown of productivity growth. This section updates the Bivens and Mishel (2015) analyses of the wedges between typical workers’ pay and productivity and the decomposition of the main factors generating it, drawing on previous work ⁷

The top panel in Table 1 provides the basic trends required to decompose the divergence. The output data cover all sectors while the compensation and wage data are for all wage and salary workers (i.e., excludes self-employed). We focus on the gap between net productivity (productivity net of capital depreciation, which is a better

metric than gross productivity for our purposes) and median hourly compensation (wages and benefits, in line 6) but provide data on median wages (line 5) and gross productivity (line 1) for completeness.⁸ We decompose the divergence between net productivity (measured as the statistical agencies do, at output prices, shown in line 2) and median hourly compensation. This allows us to compute the contribution of the differing inflation rates in output (i.e. Net National Product) than in consumer goods and services as a factor. The definitions of the variables in Table 1 and the data sources are found in Appendix A.

Over the 1979-2019 period, net productivity grew 1.36 per cent annually while median hourly compensation grew just 0.38

⁷ See Mishel and Gee (2012) and the decomposition framework developed by the Centre for the Study of Living Standards: Sharpe, Arsenault, and Harrison 2008a; Sharpe, Arsenault, and Harrison 2008b; and Harrison 2009).

⁸ Net product encompasses the income that is distributed to households.

Table 1: Contributions to Gap Between Median Hourly Compensation and Productivity Growth, 1979-2019 (Compound Annual Rate of Change)

A. Basic trends	1973– 1979	1979– 1995	1995– 2000	2000– 2007	2007– 2019	2000– 2019	1979– 2019	1979– 2017
1. Gross productivity	1.06	1.38	2.33	2.19	1.11	1.50	1.56	1.58
2. Net productivity (producer prices)	0.92	1.19	2.13	1.94	0.94	1.31	1.36	1.38
3. Net productivity (consumer prices)	0.53	0.96	1.65	1.84	0.89	1.24	1.18	1.18
4. Average hourly compensation	0.81	0.82	2.18	1.19	0.62	0.83	0.99	0.99
5. Median wage	-0.47	-0.04	1.41	0.47	0.37	0.41	0.35	0.30
6. Median compensation	0.13	0.07	1.09	0.65	0.33	0.45	0.38	0.33
7. Gross productivity–median compensation gap (1-6)	0.94	1.30	1.24	1.53	0.78	1.06	1.18	1.24
8. Net productivity–median compensation gap (2-6)	0.80	1.12	1.04	1.29	0.62	0.86	0.99	1.05
B. Explanatory factors for net productivity gap (annual growth)								
9. Inequality of compensation (4-6)	0.69	0.74	1.09	0.54	0.29	0.38	0.61	0.65
10. Loss in labor’s share of income (3-4)	-0.28	0.14	-0.53	0.65	0.27	0.41	0.19	0.19
11. Divergence of consumer and output prices (3-2)	0.39	0.24	0.48	0.10	0.05	0.07	0.19	0.20
C. Relative contribution to net productivity gap (percent of gap)								
12. Inequality of compensation	86.2	66.2	105.0	41.9	47.6	44.5	62.2	62.6
13. Loss in labor’s share of income	-35.2	12.7	-51.5	50.41	44.0	47.5	18.8	18.5
14. All inequality (12 + 13)	51.0	78.9	53.5	92.3	91.6	92.0	81.0	81.1
15. Divergence of consumer and output prices	49.0	21.1	46.5	7.7	8.4	8.0	19.0	18.9
Total	100.0	100.0	100.0	100.00	100.0	100.0	100.0	100.0

Source: Update of Bivens and Mishel (2015) Table 1. See Appendix A for data definitions and sources.

per cent annually, a sizeable divergence of 0.92 percentage points each year. The gap was primarily driven by factors associated with growing inequality—the decline of labour’s share (since 2000) and growing inequality of compensation, as shown in rows 9 and 10. These inequality factors can explain 81 per cent of the growth of the productivity-median hourly compensation gap (row 14) with the remaining portion (19 per cent) due to difference in the growth of producer (used to measure productivity) and consumer (used to measure compensation) price growth.

In the most recent period from 2000 to 2019 the inequality factors can explain 92 per cent of the divergence and the difference in deflators was much less important (8 per cent). The net productivity-median hourly compensation divergence, exclusive of the price deflator differences (line 3-6), reflects the rising inequalities we seek to explain.

We focus on the 1979-2017 period because that best fits the various studies information available on the impact of various factors. Over 1979-2017 net productivity grew 56.2 per cent (1.18 per cent per year) while median hourly compensation grew 13.5 per cent, 0.33 per cent per year a gap of roughly 43 percentage points or 1.05 percentage points per year.

We rely on this divergence of 43 percentage points to measure the extent of wage suppression. This divergence simply reflects the impact on the median hourly compensation of the growth of wage and benefit inequality and the loss of labour’s share and thus measures the counterfactual of how much faster median hourly compensation could have grown had inequality not grown. A situation where productivity and median hourly compensation progress at the same pace is not offered as a description of how we expect the economy to work nor as a normative statement. Our

analysis reviews the impact of particular factors on the growth of median wages (assumed to correspond to median compensation growth).

In the final section we examine the extent to which the cumulative impact of particular factors to gauge whether their cumulative effect can explain the divergence between net productivity and median hourly compensation growth, i.e. wage growth suppression

The decline in labour's share of income

One of the trends that alerted analysts to the erosion of worker bargaining power and the corresponding strengthening of employer bargaining power has been the erosion of labour's share of income in the 2000s. The distributional conflict between workers and employers (or capital and labour shares) is best examined in the corporate sector, where all income is divided between compensation going to workers and income accruing to owners of capital and avoids issues of having to decide whether "proprietor's income," or noncorporate businesses income is labour or capital (see Bivens 2019 for measurement details).

Labour's share fell from 82.4 per cent in 2000 to 77.9 per cent in 2007, the last year before the Great Recession. By 2016, when unemployment had reached levels comparable to what had prevailed in 2006 and 2007, labour's share remained roughly 2.5 percentage points below its 2007 level. The fall in labour's share from 82.4 per cent in 2000 to 75.5 per cent in 2016 is the equivalent of an 8.4 per cent across-the-board

cut in compensation for every employee; equivalently, it would require an across-the-board compensation boost of 9.1 per cent to restore labour's share to its 2000 level. This shift toward greater capital income and returns is even more impressive given that real interest rates have fallen sharply in recent years, a development that should (all else equal) be accompanied by a lower return to capital (Farhi and Gourio, 2018).

The Failure of Automation and Skill Gaps to Explain Wage Suppression or Wage Inequality

The predominant explanation offered by economists, pundits, policymakers, and the media to explain sluggish wage growth and growing inequality in the United States, at least until recently has been the skill-biased technological change hypothesis. It is asserted that a huge proportion of U.S. workers have "skills deficits," i.e., lack the skills necessary to deal with technological change. One version, focused on education wage gaps, argues that computerized automation has made more educated workers — generally referring to those with at least a four-year college degree - more valuable to employers and has correspondingly reduced the value of those without a college degree (Katz and Murphy, 1992; Goldin and Katz, 2007, 2008). This growing wage gap between college-educated and non-college-educated workers the college wage premium is used to explain rising wage inequality between high earners and the majority of earners who lack a four-year college credential (62 per cent of earners in 2019, down from 82 per cent in 1979).

A second version of the automation

story, frequently referred to as the “job polarization thesis,” argues that technological change has increased the value of abstract reasoning, creativity, and expertise, judgment, resulting in the devaluation of skilled work done following well-understood rules and procedures (Autor, 2010).

These versions of skill-biased technological change portray the cause of wage suppression and growing wage inequality as due to a factor, automation, that is both inevitable (one can’t stop technology’s forward march) and desirable (after all, technological change is a key driver of rising living standards). Thus, the resulting economic adversity for some workers is the unfortunate byproduct of a dynamic that one would neither want to nor could change. Given this view, the only appropriate remedy is to adapt to automation, primarily by upgrading workers’ skills and education and perhaps by providing a more adequate safety net for workers temporarily displaced.

Skill-biased technological change has always been a weak explanation for the wage trends since 1979, but is a *prima facie* implausible explanation for the trends since the mid-1990s or since 1999. None of the basic indicators of automation’s impact and of skill deficits used to establish these narratives has been evident over the last 25 years. Consequently, there is no basis for considering automation-driven skill-biased

technological change as a significant factor in wage suppression or the growth of wage inequality since the mid-1990s—and we assign it an impact of zero since 1995 in our analysis below.

Our critiques of both the skills narratives, focus particularly on their inability to explain wage trends since the mid-1990s.⁹ These arguments are fully explored in Mishel and Bivens (2021b).

Omissions and Evidentiary Problems in the Skills-based Wage-gap Story

One problem with the automation narratives is that they fail to address the superlative wage growth of the top 1 per cent (and the top 0.1 per cent) and the corresponding upward shift of 6 percentage points of aggregate earnings to the top 1 per cent between 1979 and 2019 (Mishel and Kandra, 2020). The growth of wages for the top 1 per cent primarily reflects the growth of executive compensation and the expansion of the financial sector (and its high earners). Similarly, the narratives accord no attention to the erosion of labour’s share of income. The data show that the link between automation and the decline of labour’s share is at least as inconsistent with real-world data as is the link between automation and wage inequality (Stansbury and Summers, 2020).

9 Our discussion does not cover the 1979–1995 period specifically. However, we do not assign any impact of automation and skills gaps for this period. We remain skeptical that there was any impact, though, following the analysis in Mishel, Bernstein, and Schmitt (1997a) and Card and DiNardo (2002). Wage inequality surged in the early 1980s before there was much computer automation, for instance. Plus, much of the critique of automation’s role in the period following 1995 also applies to the earlier period: there was a flat 50/10 wage gap since 1987; a spectacular growth for the top 1 per cent; and much of the growth of wage inequality was within education groups.

college wage premium

Autor, Goldin, and Katz (2020) note that “returns to a year of college rose by 6.5 log points, from 0.076 in 1980 to 0.126 in 2000 to 0.141 in 2017.” Yet note the slowdown from the former period to the 2000–2017 period. In the former period, the log college wage premium rose 0.0325 percentage points each year, far faster than the 0.0088 percentage point increase each year between 2000 and 2017. This represents a 70 per cent reduction in growth. It is evident that the education wage gap has not driven wage inequality in the top half since 2000, or perhaps since mid-90s.

demand for college graduates

The substantial deceleration in the college wage premium, even as the supply of college graduates slowed, implies a dramatic slowing in the growth of relative demand for college graduates. As Autor, Goldin, and Katz (2020:5) note:

“a puzzling slowdown in the trend demand growth for college equivalents starting in the early 1990s. Rapid and disruptive technological change from computerization, robots, and artificial intelligence is not to be found.”

If automation’s impact has been far less in the last 25 years than in earlier decades, it cannot explain the ongoing strong, even faster, growth of wage inequality in the top half, illustrated by the growth of the 95/50 wage gap.

wage gap in the bottom half

In the skills-gap story, the more education workers have, the more they are in demand and the higher their wages. Yet over the last three decades there have been no increases in the wage gaps between those with some college, those with a high school diploma, and those who left high school. Similarly, the wage gap between median (50th percentile) workers and low-wage (10th percentile) workers has been stable or declining since 1987. This is a long-standing critique of the education wage-gap hypothesis (Mishel, Bernstein, and Schmitt, 1997a; Card and DiNardo 2002; Acemoglu and Autor, 2012).

occupational employment polarization

Most strikingly, Autor (2010), Acemoglu and Autor (2012) and Autor (2014) document that job polarization has not been evident since 1999:

“[G]rowth of high-skill, high-wage occupations (those associated with abstract work) decelerated markedly in the 2000s, with no relative growth in the top two deciles of the occupational skill distribution during 1999 through 2007, and only a modest recovery between 2007 and 2012. Stated plainly, the U-shaped growth of occupational employment came increasingly to resemble a downward ramp in the 2000s.” (Autor, 2014:149–150)

Occupational employment patterns

The job polarization narrative relies on mapping occupational employment patterns to explain wage trends. But surprisingly, the polarization literature has never presented evidence that these occupational employment shifts directly affect wages. And indeed, they do not. Mishel, Shierholz, and Schmitt (2013) show that in the 1980s, 1990s, and 2000s, changes in occupational employment shares (whether employment in an occupation expands or contracts relative to other occupations) were not related to changes in relative wages by occupation. If occupational job polarization does not shape relative occupational wages, then it is certainly not much of an explanation for wage inequality.

A More Convincing Theory of Sluggish Wage Growth and Inequality: Policy-driven Wage Suppression

If forces unrelated to policy decisions, particularly automation, do not seem to be driving wage trends, what are the factors leading to wage suppression? Our answer is that there has been an intentional policy assault—including policy forbearance in the face of new anti-worker business practices—that diminished the institutional sources of leverage and bargaining power for typical workers in the labour market. The point was to suppress labour costs. This policy assault (acts of commission and omission, such as failing to up-

date labour law or the value of the minimum wage) either directly undercut these institutional sources of power or accommodated employers' efforts to undercut them. Business forces were secure knowing that policymakers (legislators, executive branch officials, and judges) would not change legislation, enforcement priorities and effectiveness, or legal interpretations to countermand this assault on a typical workers' power in the labour market.

Why this policy and corporate assault began when it did, and why it was successful politically, are questions mostly outside the bounds of this article.¹⁰ But a growing body of evidence shows that the specific policies launched in this attack can explain the overwhelming majority of wage suppression experienced in recent decades. This section identifies these policies and estimates their impact.

Austerity Macroeconomic Policy: Excessive Unemployment

The Federal Reserve Board's dual mandate is to pursue the maximum level of employment consistent with stable inflation. However, since 1979 the Fed's actions suggest that it took the inflation mandate more seriously, thereby tolerating (by failing to lower) or actually generating excessive unemployment for extended periods in the name of keeping inflation tame.

Hooper, Mishkin, and Sufi (2019: 25) note that "since the 1980s the Fed focused much more on avoiding labour market overheating in order to stabilize in-

¹⁰ See Hacker and Pierson (2011, 2020) for the political science explanations.

flation.” Mishel and Bivens (2021a, Appendix B) examines the “The intentionality of macroeconomic policies”, documenting the link of excessive unemployment to policy decisions.

Bivens and Zipperer (2018), analyzing the links between excess unemployment and wage growth, note that full employment (at least by the too conservative measure of matching actual unemployment to preexisting estimates of the “natural rate”) was the norm after World War II but became the exception after 1979. Between 1949 and 1979, the cumulative difference between the actual unemployment rate and estimates of the unemployment rate consistent with stable inflation—the “natural rate” or the NAIRU, the nonaccelerating inflation rate of unemployment—was *negative* 15.3 percentage points, meaning that on average actual unemployment was 0.52 percentage points *below* the estimated NAIRU each year. In contrast, between 1979 and 2017 the cumulative difference was positive 35.7 percentage points or 0.94 points per year, meaning that actual unemployment was persistently above the estimated natural rate.

This consistent excess unemployment was deeply damaging to wage growth. Using the lower bound of the Bivens and Zipperer estimates to assess the impact of excessive unemployment on median and 10th percentile wages in the 1979–2017 period,

we find excessive unemployment had lowered the median hourly wage by 12.2 per cent. These estimated impacts of unemployment are far below those of Katz and Krueger (1999, Table 8), whose Phillips curve estimates using a 1973–1998 time series were double those of Bivens and Zipperer at the median and three times those at the 10th percentile.¹¹

However, to err on the side of caution we make an adjustment to our estimates of the wage impact of higher unemployment to account for the “flattening” of the Phillips curve in recent years (a lessening of the relationship between unemployment and wage growth): We apply one impact for the 1979–2007 years and a lesser impact for the 2008–2017 years.¹² Taking this flattening of the Phillips curve into account we find that, if unemployment over 1979–2017 had averaged just the “natural rate” of 5.5 per cent rather than 6.3 per cent, median wages would have been 10.0 per cent higher in 2017. If the unemployment rate had been held even lower, say 5.0 per cent, median wages would have been 18.3 per cent higher by 2017.

Excessive unemployment had a larger impact on low-wage workers which included a disproportionately number of Black workers, lowering the 10th percentile wage by 11.6 per cent by 2017 from 1979 levels and raising the 50/10 wage gap by 2.7 percentage points. If our analysis uses

11 Note that the regression specification in Bivens and Zipperer (2018) (following Katz and Krueger (1999)) controls for a measure of inflation on the right-hand side which makes these estimates of the impact of excessive unemployment on real wages, i.e. a real wage Phillips curve.

12 Estimates of the wage impact of unemployment on the median and 10th percentile wage are from Bivens and Zipperer (2018, Chart 6). The impact of 1 percentage point higher unemployment lowers the median wage by 0.459 and 0.296 in the earlier and latter period and lowers the 10th percentile wage by 0.582 and 0.243 in the earlier and latter period.

5.0 per cent rather than 5.5 per cent as the full employment target, then the 10th percentile wage would have been 21.2 per cent higher in 2017 absent excessive unemployment.

Economic policy could have held unemployment to the average NAIRU rather than be one percentage point above NAIRU. The Volcker disinflation of the early 1980s was a mistake. Galbraith (1997) and DeLong and Summers (1988) have argued that the excessive unemployment was very costly and the benefits of lower inflation were overstated. Likewise, there could have been a much faster recovery from the 2007-2009 downturn. If overall public spending had simply matched the average rate of (per capita) growth in the 1980s, 1990s, and 2000s the pre-recession unemployment rate would have been restored in just 5-6 years instead of the actual eight years. (Bivens 2016).

Erosion of workers' rights to form unions and bargain collectively

The erosion of collective bargaining is the second largest factor that depressed wage growth in the middle and drove wage inequality over the last four decades.

The impact has been especially adverse for men because they were far more likely to be unionized in 1979 than women (31.5 per cent versus 18.8 per cent), so men had more to lose from the subsequent attack on unions and collective bargaining.

That collective bargaining leads to more

equal wage outcomes was firmly established by research by Richard Freeman and James Medoff in the late 1970s and popularized in their important book, *What Do Unions Do?*, published in 1984 (Jake Rosenfeld's 2014 book, *What Unions No Longer Do*, provides an update of the issues).

More recent research has incorporated an assessment of the impact of unions on nonunion workers' wage — sometimes referred to as “spillover effects”. The most recent research Fortin, Lemieux, and Lloyd (2021) provides an analysis that incorporates a spillover impact and provides additional insight because the results directly report on the impact of eroded collective bargaining on the wage gap between high-wage (90th percentile) and middle-wage (50th percentile) workers by gender. The authors have provided unpublished tabulations that provide the impact of deunionization on the median worker and median male worker.¹³

Some pundits and analysts, skeptical about the impact of weaker unions on wages or wage inequality, claim that the decline of unions reflects a decline in worker interest in unions or is due to globalization and automation, i.e., endogenous factors. Neither objection is well founded.

Kochan *et al.* (2018) examined the level of interest in joining a union among unorganized workers and found that the “demand for unions” has risen substantially since the late 1970s. Mishel, Rhinehart, and Windham (2020) assess the endogeneity of union decline and find that manufac-

¹³ Deunionization reduced the median hourly wage by 7.6 log points, or by 7.9 per cent (0.2 per cent annually). Between 1979 and 2017, the impact on men alone is larger, with deunionization lowering the male median wage by 10.9 log points, or 11.6 per cent (0.29 per cent annually).

turing employment decline can account for only a small part of it, perhaps 15–20 per cent. The authors point out that the share of workers covered by collective bargaining declined strongly across the private sector in sectors not heavily affected by globalization, including construction, transportation, communications, utilities, supermarkets, hotels, and mining. An Organisation for Economic Co-operation and Development (OECD, 2019b:15) analysis of the cross-country decline in collective bargaining across advanced nations found:

"Contrary to a commonly held belief, the combined contributions of demographic changes and structural shifts, such as the shrinking of the manufacturing sector, are small and leave most of this declining trend [in collective bargaining] unexplained."

Managing globalization on capital's terms

Globalization has played a powerful role in disempowering workers and giving capital owners and managers a much-improved fallback position in their bargaining with workers. As such, the way that globalization has proceeded from U.S. workers' perspective has been profoundly shaped by intentional policy decisions that maximized its wage-suppressing effects.

Bivens (2017a:5) presents a summary of globalization's wage impacts, based on his own calculations and on the wider economics literature. He finds:

"[T]he big damage is the permanent wage loss resulting from America's new pattern of spe-

cialization that requires less labour and more capital. Further, this wage loss is not just suffered by workers in tradeable goods sectors who are displaced by imports; it's suffered by all workers who resemble these workers in terms of credentials and labour market characteristics.... The wage-suppressing effects of globalization hit all workers without college degrees, across the country."

Bivens (2013) found that the implied wage effects of trade expanded rapidly after 1995, as trade with lower-wage nations (particularly Mexico and China) picked up significantly. He also found that, by 2013, trade flows with low-wage nations were likely reducing wages for workers without a four-year college degree by roughly 5.6 per cent. For a non-college-degree worker making the median hourly wage and working full time, full year, the earnings reduction translated into just under \$2,000 annually.

This estimate is nearly identical to what Autor, Dorn, and Hanson (2013) found in a regression-based investigation of the wage impacts of imports from low-wage countries. Their results indicate that each \$1,000 in imports per worker from low-wage countries lower American wages by 0.7 per cent. Imports from all low-wage countries in 2016 stood at roughly \$8,000 per worker, implying a wage reduction of roughly 5.6 per cent, or about \$2,000 annually, for a full-time worker earning the median wage.

Weakened labour standards

Recent decades have seen the steady weakening of a number of key labour standards that once provided leverage and bargaining power for workers to improve job quality.¹⁴ This part of the article discusses five specific areas of weakened labour standards, with particular emphasis on those that affected the median wage. A more complete discussion is found in Mishel and Bivens (2021a). The rapid erosion of the federal minimum wage's purchasing power is the most dramatic and most consequential. Other negative developments for workers protection are the erosion of overtime protection for salaried workers; weaker labour-standards enforcement and rising wage theft; the increased share of the workforce with no effective labour protections because of its immigration status, and more extensive misclassification of workers as independent contractors.

Erosion of the federal minimum wage

The failure to update the value of the minimum wage in line with wage or productivity growth is a premier illustration of policy choices, made on behalf of capital owners and corporate managers, that have had a huge impact on wage growth for low-wage workers and is the primary explanation for any growth in the wage gap between low- and middle-wage workers over the last four decades. Specifically, the failure to raise the federal minimum wage to an

adequate level (defined for our purposes as \$15 an hour by 2025) has lowered the wages of at least the bottom 22.2 per cent of earners and a full 31.0 per cent of earners if one includes those benefiting from state and local minimum wage increases since 2017.¹⁵

The growth of the minimum wage shapes the entire wage distribution of the bottom half, essentially setting the scale of the gap between the lowest-wage workers at the 10th percentile and the wages at the median.

The erosion of overtime protection among salaried workers

To be exempt from the minimum wage and overtime protections of the Fair Labor Standards Act under the “white collar” rule, a worker must be paid a salary (i.e., not be paid by the hour), must have bona fide “executive, administrative, or professional” duties (i.e., be an executive or a highly credentialed professional, or have supervisory duties), and earn above a specific salary threshold. Without a strong salary threshold, salaried workers who spend only a small share of their time actually doing exempt/“professional” work can be required to do hourly-worker-type duties (e.g., a store “manager” stocking shelves, unloading trucks, doing checkout at the cash register) for most of their work-time, including those beyond 40 hours in a week. Those hours beyond 40 are essen-

14 Shierholz (2021) reviews the evidence and importance of enforcement of labour standards.

15 This estimate is based on the impact of raising the minimum to \$15 in 2025 and including the impact on those who received minimum wage increases at the state or local level since 2017. This estimate understates the share of earners affected since it ignores those in states that had a higher minimum than the federal threshold minimum wage in 2017 but did not increase it further since then.

tially unpaid.

The eroded share of the salaried workforce eligible for this overtime protection (i.e., receiving 150 per cent of regular hourly wages when working more than 40 hours a week) is another example of a labour standard that was substantially weakened in the last four decades. The share of the salaried workforce automatically eligible for overtime based on its pay was whittled down from roughly half (49.6 per cent) in 1975 to just 9.9 per cent in 2014 (Kimball and Mishel, 2016).

Analysis by the Department of Labor (2016) of the 2016 rule showed that raising the salary threshold increased hourly wages by for salaried workers directly affected by the rule.¹⁶

How much has the erosion since 1979 affected median wages? This depends on the impact on hourly wages of those affected and the share of middle-wage workers, say the middle fifth, affected by these overtime rules. The impact on the hourly wages of those affected by eroded protections would likely be about 1 per cent. But not all mid-level earners have been affected by changes in overtime protections. We assume that one-third of middle-wage earners lost 1 per cent of wages due to lost overtime protections, so the overall impact would be a 0.3 per cent reduction of hourly wages for the middle fifth.

Wage theft and weaker enforcement of labour standards

Many workers, particularly low-wage workers and the women and men of color who are disproportionately in this category, frequently fail to receive the wages they are owed. This is referred to as “wage theft” and reflects workers being paid below the minimum wage, not being paid for all hours worked, not being paid time-and-a-half though legally eligible for overtime, experiencing illegal deductions from pay, and having their tips stolen by employers or supervisors.

How extensive is wage theft? A 2008 study of 4,387 workers in low-wage industries in Chicago, Los Angeles, and New York; found that two-thirds of workers surveyed experienced at least one pay-related violation in any given week. The average violation amounted to 15 per cent of earnings (Bernhardt, Milkman, and Theodore 2009).

How much does wage theft affect wages in the middle and at the bottom? We do not have an estimate of aggregate wage theft across the wage spectrum or for middle-wage workers, so it is not possible to assess the impact of wage theft on the median wage. Among low-wage workers, Bernhardt, Milkman, and Theodore (2009) found that 68 per cent experience wage theft violations averaging 14.95 per cent of earnings. This translates into an average loss across all low-wage workers of 10.2 per cent. A speculative estimate is that if wage theft has doubled to the 10.2 per cent level implied by the Bernhardt, Milkman, and Theodore study, then it caused low-wage

¹⁶ Hourly wages increased 1.1 per cent for workers who occasionally worked overtime, 2.8 per cent for workers who regularly worked overtime and were newly covered by overtime protections. and 1.4 per cent for workers who regularly worked overtime and remained exempt.

workers' earnings to fall 5 per cent over the 1979–2017 period due to weaker wage standards enforcement, less access to legal recourse, and eroded unionization. For mid-level wages, theft of overtime pay, unpaid worktime, and the undercutting of prevailing wages likely also had an adverse impact.

Immigration policy that creates 'labour standard free zones'

Employers have increasingly hijacked immigration policy to create zones in the labour market where workers' ability to obtain enforceable basic labour standards is compromised by their immigration status. Note that the issue is not just the presence, or supply, of immigrants, but the legal situation that makes undocumented workers exploitable. In our economy, if you can be exploited, you will be. This exploitation of a sizable share of the workforce lowers the wages of migrants as well as those of the workers in their occupations and industries (Costa, 2019). Combining the estimates of unauthorized immigrants and guestworkers means that 6 per cent of the workforce is vulnerable to exploitation due to its legal status (Krogstad, Passel, and Cohn, 2019; Costa and Rosenbaum, 2017).

Research by Apgar (2015) comparing the wages of comparable migrant Mexican workers who were undocumented, had legal permanent resident status, or were temporary guestworkers in the H-2A and H-2B visa programs, found that unauthorized workers earned about 13 per cent less than legal permanent residents; temporary foreign workers (i.e., guestworkers) earned about 11 per cent less than legal permanent residents, and their wages did not sig-

nificantly differ from unauthorized workers' wages.

The presence of exploitable migrant workers therefore undercuts labour standards in immigrant-intensive occupations and industries and thereby depresses wages and benefits of nonmigrants. Historical research highlights the intent of many employers in expanding the pool of workers in the United States who lack basic worker rights because of their immigration status. The conscious policy decisions to allow these circumstances clearly contribute to wage suppression.

Misclassifying employees as contractors

Employers in an array of industries have increasingly (and illegally) misclassified employees as independent contractors or are paying workers "off-the-books." This practice cheats workers of fringe benefits, social insurance protection (Social Security, unemployment insurance, workers' compensation), labour protections (regarding safety/health and race, age, and gender discrimination), and union rights. The point of this misclassification is to lower labour costs, and it undercuts labour standards and "undermines other, more responsible employers who face costs disadvantages arising from compliance with labour standards and responsibilities" (Weil, 2017:3).

It is difficult to quantify the extent of misclassification, since it is an illegal activity, and the extent to which it lowers wage and benefit costs. The fact that venture capitalists force this model on gig economy upstarts provides practical confirmation that the business strategy lowers labour costs and shifts risks to workers.

Uber, a prominent example of a firm whose business strategy is built on misclassifying rideshare drivers, acknowledged in its registration for an initial public offering (Uber 2019) that misclassification provides substantial cost savings.

Indications are that the practice has greatly increased. The last comprehensive federal estimate of independent contractor misclassification, a General Accounting Office (GAO) examination of tax year 1984, “found that 15 per cent of employers nationwide and across industrial sectors engaged in misclassification of a total of 3.4 million workers” (Carré, 2015:10).

Industry analyses provide information, too, on the numbers of workers affected.¹⁷

Precise estimates of the impact of rising misclassification are not possible with available data, but one can speculate about a range of possible impacts. To gauge the impact we assume that the 3.4 million misclassified workers found by GAO in 1984 (4.4 per cent of nonagricultural wage and salary employment) have risen to 9.0 million (a 7.4 per cent share)¹⁸, and that misclassification lowers wages by ei-

ther 15 per cent or 30 per cent. Further, we will assume that misclassification is either spread throughout the private nonagricultural wage and salary workforce or, more likely, targeted at the bottom two-thirds; in the former case the share of misclassified workers in total employment rises by 3.0 percentage points, while in the latter case it rises by 4.5 percentage points. The impact is likely to have been on both low-wage and middle-wage workers. These parameters provide a range of impacts: Misclassification lowered wages by between 0.5 per cent and 0.9 per cent if applied across the whole workforce and between 0.7 per cent and 1.4 per cent if affecting and applied to only the bottom two-thirds.¹⁹ If one included all workers, including those in the public sector, then the estimated impacts would be proportionally less. We take a 1 per cent decline in the median wage as our ballpark estimate.

Failures to police or check new forms of employment ‘contracts’

Employers are increasingly requiring em-

17 Ormiston, Belman, and Erlich (2020) estimate that in construction “between 1.30 and 2.16 million workers were misclassified or working in cash-only arrangements in an average month of 2017.” The major rideshare companies, whose business model incorporates misclassification, have between 1 million and 2 million drivers. Other online demand firms also rely on misclassification. A newspaper investigation by Locke and Ordonez (2014) analyzing payroll records for government-backed construction housing projects across 28 states found that “companies using stimulus money routinely snubbed labor law and the Internal Revenue Service by treating workers as independent contractors in a clear violation of what’s allowed.” These companies “listed workers as contractors instead of employees in order to beat competitors and cut costs. . . .Scofflaws can save 20 per cent or more in labor costs by treating employees as independent contractors.” Misclassification is common in trucking (Bensman 2009, cited in Carré 2015, Appel and Zabin (2019)) and in construction (Ormiston, Belman, and Erlich (2020)).

18 The 7.4 per cent is the share of the nonagricultural private wage and salary workforce if 9 million workers are misclassified in 2017.

19 For instance, a rise of 3.1 percentage points of the entire private nonagricultural workforce yields a 0.5 per cent or 0.9 per cent wage reduction if misclassified workers are paid, respectively, 15 per cent or 30 per cent less than regular W-2 workers. Similarly, a rise of 4.6 percentage points among the bottom two-thirds of the private nonagricultural workforce yields a 0.7 per cent or 1.4 per cent wage reduction if misclassified workers are paid, respectively, 15 per cent or 30 per cent less than regular W-2 workers.

employees to relinquish various rights when they accept employment or even after they are already employed. Noncompete and forced arbitration agreements are chief among these restrictions, and employers within various franchise chains also collude against employees through anti-poaching agreements. All of these agreements limit workers' options by limiting access to courts and the ability to readily find another job or even to know the basic terms of their employment arrangement. This works to suppress wages.

Noncompete agreements

Employers have increasingly required employees to sign noncompete agreements, which limit options for future employment and are now widespread. The practice suppresses worker mobility and suppresses wages, and it depresses firm entry and dynamism because employees are prohibited from starting their own firms (Starr, 2019b and 2020).

How widespread are noncompete agreements? A 2017 national survey of private-sector American business establishments with 50 or more employees, found that it was "somewhere between 27.8 per cent and 46.5 per cent of private-sector workers are subject to noncompetes" (Colvin and Shierholz, 2019).

These data indicate that noncompetes have grown in their use since a survey of employees in 2014 showed just 18 per cent of the U.S. workforce covered by them, though 38 per cent were subject to one at some point in their careers (Starr, Prescott, and Bishara, 2020). The precise extent of the increased incidence of noncompetes is

uncertain, however: The Colvin and Shierholz employer-based survey probably captures more noncompete use than the earlier employee-based survey, since many employees are unaware of having signed a noncompete agreement.

Noncompetes lower wages and mobility for both technical and low-wage workers, whether they reside in states where the contracts are enforceable or in those, such as California, where they are not. Moreover, "where non-competes are really common and highly enforced, the whole labour market suffers" (Starr 2019b), as wages, job mobility, and job satisfaction decline even among those not directly affected.

What is the impact of increased use of noncompete agreements on median wages, low wages, and various wage gaps? The best evidence regarding noncompetes and wage levels is the Lipsitz and Starr (2020) examination of the relationship between Oregon's 2008 ban on noncompetes for low-wage workers and the average hourly wages of hourly paid workers. The finding that the ban raised wages for hourly workers by 2.2 per cent to 3.1 per cent reflects the impact on those directly affected (about 14 per cent of hourly workers are subject to noncompetes) and the spillover effects on other comparable workers. It is important to note that these results are for hourly, not all, workers, and hourly workers comprised 67 per cent of Oregon earners.

Two indications in the Lipsitz and Starr research provide clues to the impact on the median worker. One is that the ban's impact was comparable across the 20th to 80th wage percentiles of hourly workers, suggesting that the impact on the median would be comparable to the 2–3 per cent

average effect (if hourly workers comprise the bottom 67 per cent of earners, then the overall median is the 75th percentile of hourly workers). On the other hand, Lipsitz and Starr report that the impact of the noncompete ban was higher for two occupation groups with wage levels close to the overall median: In construction occupations and installation, maintenance, and repair occupations wages rose by 4.9 per cent and 4.3 per cent, respectively. The ban had basically no effect on a low-wage occupation, food service preparation. These differences across occupations reflect both the incidence and direct impact of noncompetes. In sum, these results suggest that the impact of noncompetes on the median is in the 4.3 per cent to 4.9 per cent range, there is little if any impact for the lowest-paid workers, and noncompetes actually narrow the wage gap (50/10) in the bottom half by depressing the median wage but not affecting the lowest-wage workers.

Assessing the impact of the increased use of noncompetes on median wage growth since 1979 requires quantifying that increased use. Unfortunately, there is no historical series on noncompete incidence. The agreements have been used for many years, especially among higher-wage professionals and executives, and use has increased as evidenced by the increased public and policymaker attention to the agreements, particularly for middle-wage or lower-wage (e.g., Jimmy John's sandwich shop workers) workers. If, say, the incidence among hourly workers has doubled

since 1979 and the wage impact is roughly 4.5 per cent in recent years, then noncompetes have lowered the median wage by about 2.25 per cent.²⁰ It seems equally plausible to us, however, that “doubling” is an underestimate, since we know the incidence of forced arbitration agreements has enormously increased since the early 1990s (from 2 per cent in 1992 to more than 50 per cent in 2017), and firms insisting on forced arbitration also tend to insist on noncompetition agreements. So, we take the 2.25 per cent impact on median wage growth as a rough estimate.

Forced arbitration and class action waivers

The increasingly common employer requirement that workers sign arbitration agreements is another clear example of policy decisions, limiting workers' options to resist workplace exploitation. Forced arbitration is among a suite of agreements being forced on workers as a condition of employment (Colvin and Shierholz 2019). It suppresses claims, makes them less likely to succeed, and reduces awards. The consequence is the undermining of the enforcement of employment rights ranging from minimum wage and overtime pay to rights to equal pay and freedom from discrimination or harassment based on race, gender, or religion (Stone and Colvin 2015, Colvin 2018, and Deutsch *et al.* 2019).

The incidence of forced arbitration agreements took off after key Supreme Court decisions in 1991 and 2001 made

²⁰ The impact might be lower if we base the assessment on the 2.2 per cent to 3.1 per cent overall wage effect identified by Lipsitz and Starr (2020) or if the rise in incidence is less than double.

clear “that an American employer may, with near total impunity, require an employee, as a condition of hiring and continued employment, to use private arbitration as the means of resolving public claims against the employer that involve a statutorily protected right” (Lipsky 2007:10). In 1992, just over 2 per cent of the workforce was covered by forced arbitration agreements, but that share rose to almost a quarter by the early 2000s. By 2017 the share was 56.2 per cent (Colvin 2018).

It is not possible to assess the wage impact of the spread of forced arbitration agreements. The practice is intended to and does undermine the enforcement of employment and civil rights workplace protections, further limiting employee options to resist employer exploitation.

Employer collusion and anti-poaching agreements

We do not know the extent of collusion among employers and how it has changed over time. It is, after all, illegal. There is research on explicit collusion in franchising, however, because this is a gray area in the law.²¹

Unfortunately, there is no systematic evidence of no-poaching agreements’ impact on workers’ pay and within-franchise job mobility. We do know that these agree-

ments grew substantially over the 1996–2016 period, however, and disproportionately affect workers in low-wage industries and “potentially affect a large number of workers” (Krueger and Ashenfelter 2018).

Tolerating new business structures that disempower workers

In recent decades, employers have increasingly tried to build up concentrated power in product markets (as well as labour markets directly) and to leverage this increased product market power to augment their profitability and the pay of executives by lowering costs and suppressing wages. One mechanism has been to match market concentration with efforts to outsource key parts of their production or workforce to keep those costs from making a claim on the firm’s income. In past years, policymakers might have used industry regulation such as in airlines and trucking and antitrust enforcement to keep these changes in check. But in recent decades, the pushback against these changes in business structure has been rare and muted.

Fissuring: contracting out/outsourcing, temping, and franchising

Perhaps the most pronounced way that employers have attempted to shape

21 Krueger and Ashenfelter (2018) report on anti-poaching agreements in franchises, agreements that limit a particular franchise of McDonald’s, for instance, from hiring a worker from another McDonald’s franchise.

22 David Weil’s book, *The Fissured Workplace* (2014), as well as analyses by Appelbaum and Batt (2014), provide the details about what fissuring is and how it works to the advantage of employers. Weil points out that fissuring should be distinguished from contingent work or alternative work arrangements. “Fissured workplace arrangements can exist even though employment itself might be traditional (that is, ongoing and full time) when the worker is employed by a subcontractor, franchisee, or other business organization undertaking the work of a lead business.”

labour market outcomes to their advantage through changes in business structure is the “fissuring” of workplaces.²²

Fissuring is a corporate strategy that emerged from the focus on shareholder value. It raises profits in part by squeezing the costs of subcontractors, who in turn cut wages, and shifting risks onto other firms and workers. Fissuring probably has no impact on aggregate productivity, or on making the production of goods and services more efficient. Instead, its effects are overwhelmingly distributional, suppressing wages and profits among suppliers to the benefit of the contracting firms (Appelbaum and Batt, 2014).

But estimating the size of the fissured economy is a major challenge researchers are only now undertaking. However, it seems clear that somewhere between a fifth and a third of the economy is characterized by fissuring as a dominant force (Weil, 2019).

Growth in fissuring seems to have primarily occurred in business-to-business domestic outsourcing or subcontracting and not through use of independent contractors, staffing agencies, or franchising. Various studies confirm that workers in contractor firms earn less.

Fissuring, and particularly the outsourcing of particular tasks, is probably responsible for the fact that workers in the largest firms no longer receive higher pay than those in medium-sized firms. As Bloom *et al.* (2018) show, those in firms with

more than 2,500 employees were not paid more in the 2007–2013 period than those in firms that had 1,000 to 2,500 employees, a sharp drop from what prevailed in the 1980s. This erosion of the quality of jobs in large firms affected a large swath of the workforce, as employment in firms exceeding 2,500 employees comprised 39.0 per cent of all jobs in 2014 compared to 37.0 per cent in 1999 and 35.3 per cent in 1979.²³

A speculative estimate of the impact of fissuring is that a shift of 15 percentage points of employment into fissured workplaces earning 15.0 per cent less (Goldschmidt and Schmieder 2017) would yield an overall decline of wages of 2.25 per cent overall.

Product and labour market concentration, including dominant buyer

There has been increasing interest in two key changes in corporate structure in recent decades: product and labour market concentration (sometimes referred to as monopoly and monopsony).²⁴ It seems clear that there are many reasons for policymakers to be concerned about market concentration. Robust efforts (antitrust or regulation) to confront the malign effect of concentration should be part of the policy toolkit going forward.

Labour market concentration.

Though labour market concentration is definitely associated with lower wages, evi-

²³ Analysis of the Census Bureau’s Longitudinal Business Database.

²⁴ We will not use the label “monopsony” here for labour market concentration, as modern labour economics has adopted the term “monopsony” to describe a wide range of influences—including but not limited to market concentration—that give employers power to set wages.

dence remains lacking that it has increased so as to greatly contribute to wage suppression.²⁵

Product market concentration—monopoly power in product markets.

The growth of product market monopoly power over prices does not seem to have contributed to wage suppression, though firms may have leveraged their monopoly positions to suppress wages and profits in supplier chains.²⁶

Rising monopoly power in product markets that has harmed U.S. households through excessive price growth seems unlikely to be a major channel through which concentration may be dragging on wage growth.

Product market concentration—dominant buyers squeezing suppliers..

In traditional conceptions of the harms done by product market concentration, firms' monopoly power is leveraged against consumers of their output, with prices being pushed above what would prevail in competitive markets. However, many real-world firms with substantial market share (Walmart and Amazon, for example) charge their own customers seemingly low prices while leveraging their market power instead against the firm's own suppliers, coercing them into providing supplies at low prices. This in turn squeezes both profits and wages for the supplier firms.

Path-breaking research by Wilmers

(2018) has identified and quantified the impact of these "dominant buyers." Wilmers estimates that the share of nonfinance suppliers' revenue obtained from dominant buyers increased from 5 per cent in 1979 to 19 per cent in 2014 overall and from 6 per cent to 26 per cent in manufacturing and logistics. Wilmers argues that there was not only an increase in the role of dominant buyers but also an intensification of their wage impact. Wilmers estimates that the increase in dominant buyers lowered the growth of average annual earnings by 3.4 percentage points over the 1979 to 2014 period among publicly owned nonfinancial firms.

Deregulation of industries

Starting in the late 1970s, Congress deregulated various industries, including airlines, trucking, interstate busing, telecommunications, utilities, and railroads. Fortin and Lemieux (1997) showed that deregulation had a strong adverse impact on the wages of blue-collar workers for 9 per cent of the workforce. Card (1996) found a 10 per cent decline over 1980–1990 in the relative earnings of airline workers after deregulation. Deregulation also weakened the ability of employers to pay high wages and in many sectors, most notably trucking, led to a steep erosion of unionization (Viscelli, 2016). Unfortunately, we

25 Key papers assessing the effect of labour market concentration include Azar, Marinescu, and Steinbaum (2017); Benmelech, Bergman, and Kim (2018); Rinz (2018); and Naidu, Posner, and Weyl (2018). The evidence also shows that the average labor market is highly concentrated but the average worker is not employed in a concentrated labor market.

26 Key papers directly assessing the effect of product market concentration include Autor *et al.* (2017b); Barkai (2020); De Loecker, Eeckhout, and Unger (2020); Grullon, Larkin, and Michaely (2015); and an analysis by Goldman Sachs (Struyven 2018).

do not have an estimate of the impact of deregulation on wages.

Wage suppression and upward distribution to the top 1 per cent

The data are clear that wage growth for the vast majority of U.S. workers decelerated radically in the post-1979 era. This near-stagnation of median wages cannot be nearly fully explained by the slowdown in the economy’s overall ability to pay higher wages (measured, for example, by growth in economy-wide productivity). Overall output and income growth did slow significantly post-1979, but growth for the bottom 90 per cent of wage earners slowed far more. This pattern left a large excess available for the top 10 per cent to grab, and most of it went to the top 1 per cent and, especially, the top 0.1 per cent. While this article does not undertake to directly explain the growth of wages at the very top those of the top 0.1 per cent and 1 per cent we would argue that this growth is the mirror image of wage suppression at the bottom. The forces that weighed on wage growth for the majority (excess unemployment, stagnation of the minimum wage, deunionization) largely do not slow wage growth for the top 1 per cent; instead, they allow more income (wages, and profits that are not going to typical workers’ paychecks) to be claimed by the very top. In a sense, the wage suppression felt by the bottom 90 per cent was zero-sum (or even negative sum), as their loss financed a sharp redistribution of wages and incomes to the very top.’

Bivens and Mishel (2013) highlight the growth of Chief Executive Officer (and

other executive) pay and the incomes of financial-sector professionals as the predominant source of the escalated wage and income growth at the top. This partly reflects the surge in the stock market which fuels executive and financial sector growth in pay. A vast body of research demonstrates that no plausible force coming from the interplay of competitive markets could account for the explosive income growth of these actors. These are not the “just deserts” of the high earners reflecting their heightened productivity.

Aggregate Impact of the Policy Choices Generating Wage Suppression

This section draws on the earlier assessments of the factors generating wage suppression to account for the divergence between the growth of net productivity and median hourly compensation over the 1979–2017 period

Relation to other literature

Our analysis builds on what Stansbury and Summers (2020) referred to as a “long history of progressive institutionalist work exemplified by Freeman and Medoff (1984), Levy and Temin (2007), and Bivens, Mishel, and Schmitt (2018).”

An important recent marker in this tradition was the keynote address by former chairman of the Council of Economic Advisers and Princeton economist Alan Krueger (Krueger, 2017) to the Federal Reserve Board Jackson Hole conference. Krueger said that certain economic models “give employers some discretion over wage

setting” and, in a footnote, said, “Notice that I don’t call these features ‘imperfections.’ They are the way the labour market works. The assumption of perfect competition is the deviation from the norm of ‘imperfection’ as far as the labour market is concerned.”

The new monopsony literature reinforces our narrative in important ways and further highlights the need to identify the specific factors generating employer power over wages and ways this power has changed over time. A broad interpretation of employers’ “monopsony” power does not hinge on labour market concentration (i.e., the proverbial one-company town), but instead diagnoses labour markets as being affected by employers’ exercise of power that allows them to cut wages without fear of losing a large portion of their workforces—regardless whether the source of this power is market concentration or anything else. The focus needs to be on employer power relative to employees, so the erosion of countervailing power of employees is an essential dimension of understanding how employer power matters.

The emerging monopsony literature shows that employer power is ubiquitous in the modern U.S. labour market.²⁷ The monopsony literature has identified a substantial amount of employer power such that employers are able to, as Bassier,

Dube, and Naidu (2020) put it, “mark down” wages by anywhere from 20 per cent to 50 per cent.²⁸

One way to interpret the evidence in the current paper is that employer power is the constant of modern labour markets, but what has changed over the past generation in the United States to generate anemic wage growth is the erosion of institutions and policies—high-pressure labour markets, unions, and binding minimum wages—that once provided countervailing power. Naidu and Sojourner (2020) have a similar interpretation:

This new monopsony literature provides a top-down analysis, which has primarily focused on estimating the aggregate scale of employer power. Some of the recent contributions have started to identify the underlying factors, examining the role of unionization, high-pressure labour markets, and high values of minimum wages, in explaining an aggregate metric of monopsony power. In contrast, our study is a bottom-up analysis examining the impact of myriad specific factors and gauging their contribution to the productivity–median compensation divergence over the past four decades.

Explaining the divergence between productivity and median hourly compensation growth

27 Webber (2015 and 2020); Dube, Giuliano, and Leonard (2019); Dube *et al.* (2020); Bassier, Dube, and Naidu (2020); Azar, Marinescu, and Steinbaum (2019); Langella and Manning (2020); Card *et al.* (2018); and the meta-analysis by Sokolova and Sorensen (2020)

28 There is some evidence on the time trend of employer monopsony power; two studies have shown that employer power increased since the late 1990s (Webber 2020; Langella and Manning 2020), though Bassier, Dube, and Naidu (2020, Table 6) show stability over the 2003–2012 period. One consistent finding of these studies is that employers are able to exert more power over low-wage than other workers, affirming that employer power generates wage inequalities.

This section examines the corporate and government policy levers that have suppressed wage growth, and concludes that they can account for the vast majority of wage suppression.

It can be difficult to assess causality and take interactions into account. But looking at the sum of the impact of the key factors supports the narrative that intentional policy decisions (either of commission or omission) have generated wage suppression. Analysts may differ on the assessment of particular factors, but our hope is that this compilation inspires further efforts, including ones for which we do not have sufficient empirical work to even make guesses.

How much needs to be explained? In our discussion of Table 1 we noted that between 1979 and 2017 net productivity (economy-wide productivity net of depreciation) grew 56 per cent while median hourly compensation (wages and benefits) grew 13 per cent, leaving a 43 per cent divergence.²⁹ By deflating both net productivity and the pay measures by the CPI-U-RS index, we have stripped out the influence of differing deflators (for productivity and compensation) from our calculation of the divergence, leaving only the changes in labour's share of income and changes in compensation inequality as drivers of the divergence

(Bivens and Mishel 2015).

The impact of specific factors on the growth of the median wage is detailed in the first panel (Table 2) and draws on the discussion above.³⁰

The share of the various factors in explaining the overall divergence of net productivity and real hourly compensation as presented in Table 2 is illustrated in Panel A of Chart 3 (examining growth, in percent, of factors) and Panel B of Chart 3 (examining growth, in dollars, of factors).

Austerity macroeconomic policy (excessive unemployment)

The impact of excessive unemployment caused by contractionary macroeconomic policy, promulgated to control inflation, (suppressing labour costs in the name of controlling inflation) reduced wages for the median worker by 10.0 per cent between 1979 and 2017. Adjusting for the “flattening” of the Phillips curve since 2008, as we do here, lessens the impact of higher unemployment on wage growth; without this adjustment the impact would have been 12.2 per cent.

Erosion of Collective Bargaining

The erosion of collective bargaining had an adverse impact by lowering the wages

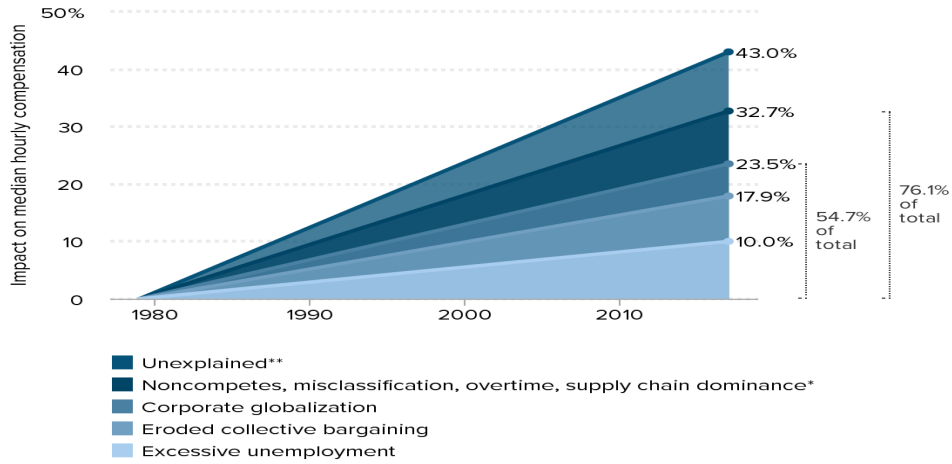
29 If we used hourly compensation of production workers (82 per cent of payroll employment) as the pay measure rather than the median wage, the divergence would be even greater (45.1 percentage point divergence from a net productivity growth of 56 per cent and real hourly compensation of production workers growth of 11 per cent).

30 For purposes of the analysis we equate the impacts on median wages, as identified above, to be the same as the impact on median hourly compensation: this is not a consequential decision since the 13.0 per cent growth of median hourly compensation over the 1979–2017 period just slightly exceeded the 12.2 per cent growth of median hourly wages.

Chart 3: Factor's Contribution to Productivity-Median Compensation Divergence, 1979-2017

Panel A: Percentage Point Contribution

Factor's percent contribution to productivity--median compensation divergence, 1979–2017

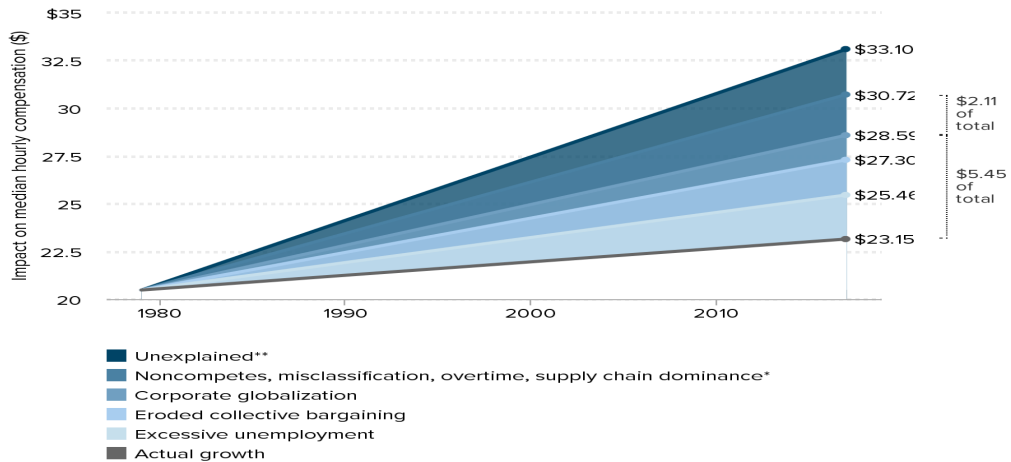


Notes: Automation/skill deficits had no effect.
 * Dominant buyer and fissuring
 ** Including but not limited to: wage theft, guestworker programs, racial discrimination, industry deregulation, forced arbitration, and anti-poaching agreements
Source: Authors' analysis from Table 3.

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Panel B: Dollar Contribution

Factors dollar contribution to productivity--median compensation divergence, 1979–2017



Notes: Automation/skill deficits had no effect.
 * Dominant buyer and fissuring
 ** Including but not limited to: wage theft, guest worker programs, racial discrimination, industry deregulation, forced arbitration, and anti-poaching agreements
Source: Authors' analysis from Table 3.

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Note: Automation/skill deficits had no effect.
 *Dominant buyer and fissuring
 **Including but not limited to: wage theft, guest worker programs, racial discrimination, industry deregulation, forced arbitration and anti-poaching agreements
Source: Authors' analysis from Table 3

Table 2: Impact of Policy Areas on Median Wage Growth, 1979-2017
(percentage points)

1	Excessive Unemployment*	10.0
2	Erosion of Collective Bargaining	7.9
3	Globalization	5.6
4	Weaker Labour Standards	
	Erosion of Minimum Wage	0
	Overtime Coverage for Salaried Workers	0.3
	Wage Theft	n.a
	Missclassification	1.0
	Increased Presence of Undocumented	n.a
	Guest Worker Programs	n.a
5	Employer-Imposed Contract Terms	
	Noncompetes	2.25
	Anti-Poaching	n.a
	Forced Arbitration	n.a
6	Corporate Structure Changes	
	Labour Market Concentration	0
	Dominant Buyer	3.4
	Fissuring	2.25
	Product Market Concentration	0
	Industry Deregulation	n.a
7	Automation/skill-biased technological change	
	1979-1995	n.a
	1995-2017	0

*Average relative to 5.5% unemployment

Sources: Authors' analysis based on the following studies: Excessive unemployment estimate based on Bivens and Zipperer (2018) and Katz and Krueger (1999); erosion of collective bargaining estimate based on Fortin, Lemieux, and Lloyd (2021), Stansbury and Summers (2020), Western and Rosenfeld (2011); globalization estimate based on Bivens (2013) and Autor, Dorn, and Hanson (2013); erosion of minimum wage estimate based on Fortin, Lemieux, and Lloyd (2021) and Autor, Manning, and Smith (2016); overtime coverage for salaried workers estimates based on analysis of Department of Labour (2016); noncompetes estimates based on Lipsitz and Starr (2020); dominant buyer estimates based on Wilmers (2018); fissuring based on Weil (2019); automation/skill-biased technological change from 1995–2017 estimates based on Autor, Goldin, and Katz (2020) and Autor (2017).

Note: n.a. means not available

of non-college-educated workers, particularly men, and has also lowered the wages and benefits of nonunion workers in sectors where collective bargaining had previously set wage patterns. We relied on an unpublished analysis of the Fortin, Lemieux, and Lloyd (2021) model to pinpoint at 7.9 per cent the impact of deunionization on the median wage of all workers (men and women combined) for the 1979–2017 period.

Globalization on capital's terms

Bivens (2013) found that, by 2013, trade flows with low-wage nations were likely reducing wages for workers without a four-year college degree by roughly 5.6 per cent.

For a non-college-degreed worker making the median hourly wage and working full time, full year, this translates to about \$2,000 annually. This estimate is nearly identical to what Autor, Dorn, and Hanson (2013) find in a regression-based investigation of the wage impacts of imports from low-wage countries.

Impact of the top three factors

As summarized in Table 3, together these three factors alone—excessive unemployment, eroded collective bargaining, and corporate-driven globalization—can account for a 23.5 per cent decline in the median wage growth from 1979 to 2017 and for 54.7 per cent of the divergence be-

**Table 3: Impact of Policy Decisions on Median Wage Growth, 1979-2017
(percentage point)**

	Impact on median wage (percentage points)	Share of divergence explained (percentage points)
Excessive unemployment; erosion of collective bargaining; globalization.	23.5	54.7
Other(Overtime, misclassification, fissuring, dominant buyer, noncompetes)	9.2	21.4
Automatom/skill deficits	0	0
Total explained	32.7	76.1
Unexplained*	10.3	23.9
Divergence btw productivity-median hourly compensation, 1979-2017	43	100

*Including but not limited to: wage theft, guest worker programs, racial discrimination, industry deregulation, forced arbitration and anti poaching agreements.

Source: Estimates presented in Table 2

tween net productivity and median hourly compensation. Chart 3 shows that excessive unemployment, eroded collective bargaining, and corporate-driven globalization lowered the growth of median hourly compensation by \$5.45: absent these factors median hourly compensation would have risen to \$28.59 rather than to \$23.59.

Weaker labour standards

The failure to update the value of the federal minimum wage is a premier example of policy action shaping the wage structure and undermining the wages of the bottom third of earners (heavily women and minorities), or 46 million workers. The minimum wage’s impact probably does not extend to the median, so we express that as zero in Table 3.

The erosion of other labour standards likely had an impact throughout the wage structure. Overtime protections for salaried workers declined precipitously and reduced median workers’ wages by 0.3 per cent, while growing misclassification of workers as independent contractors lowered the median wage by 1.0 per cent. Other

practices and policies, like lax protections against wage theft, the increased presence of undocumented workers and guestworkers, and more extensive racial discrimination have likely lowered wages, but we are not able to provide an empirical assessment.

Employer-imposed contract restrictions

Employers have increasingly required employees to relinquish various rights when they accept employment, or even after they are already employed, through agreements regarding noncompetition and forced arbitration. Employers within franchise chains have also colluded against employees through anti-poaching agreements, which limit workers’ employment options. The effort to quantify the impact of these policies is still in the beginning stages. We estimate that noncompete agreements have reduced the median wage by 2.25 per cent, but we have not been able to derive estimates of the impact of forced arbitration (now covering more than half of nonunion employees) nor of anti-poaching agreements among franchisers.

Changes in corporate structure

Changes in corporate structure — from deregulation to fissuring to rising market concentration—likely pushed down wages by at least 5 per cent by 2017. A speculative gauge of the impact of a shift of 15 percentage points of employment into fissured workplaces where wages are 15 per cent less would imply an overall decline of wages of 2.25 per cent and probably an even larger decline at the median. Wilmers' (2018) estimated that the increase in dominant buyers lowered annual earnings by 3.4 per cent over the 1979–2014 period among workers in publicly owned nonfinancial firms.

There is likely to be some double counting when aggregating the fissuring and dominant buyer factors, but it is also likely that the unassessed components of corporate structures exerted at least as much downward wage pressure to offset it.

Automation/skill-biased technological change

As detailed earlier (and in Mishel and Bivens (2021b)), automation and skill-biased technological change are *prima facie* implausible explanations of the wage suppression or wage inequality experienced at least since 1995. Given the deceleration of the salient indicators of automation and automation's impact on key labour market metrics (relative demand for college education, occupational polarization), we assign no impact in Table 2 to automation in

driving the productivity–pay divergence for the 1995–2017 period. We are also skeptical that there was any impact in the earlier 1979–95 period, following the analysis in Mishel, Bernstein, and Schmitt (1997a) and Card and DiNardo (2002).

Conclusion

In all, the policy-driven factors delineated in Tables 2 explain a vast share of the divergence between productivity and median hourly compensation.³¹

The best-measured impacts, those for excessive unemployment, eroded collective bargaining, and corporate-shaped globalization, can account for 23.5 percentage points (or 55 per cent of the total) of the 43 percentage points productivity–median compensation divergence. The harder-to-measure impacts of other factors (lowering of the overtime threshold for salaried workers, misclassification, noncompete agreements, and changes in corporate structures like fissuring) can collectively account for another 9.2 per cent of the erosion of the median wage and explain another 21.4 per cent of the divergence. These sum up to explaining about three-fourths (76.1 per cent) of the divergence (Table 2 and Chart 1). This is an understated conclusion since there are many additional policy factors that we have not been able to empirically assess: wage theft, guestworker programs, racial discrimination, industry deregulation, exploitable immigrants, forced arbitration, and anti-poaching agreements.

31 See Mishel and Bivens (2021a) for a discussion on the suppressed wage growth at the 10th percentile and the increase in the 50/10 percentile wage gap

It is possible that summing these estimates overstates the aggregate impact if there is some endogeneity or interactions (e.g. higher unemployment causes greater loss of unions). On the other hand, there are reasons to believe that the impact of these factors is larger than the sum of their individual effects. One way of understanding what has happened is to gauge all the ways that an individual workers' options to obtain better employment conditions or to affect their current employment have been increasingly foreclosed—limiting both exit and voice. When workers want to improve their conditions of work, they have increasingly limited options to organize a union, rely on adequate and enforceable government standards (e.g., the minimum wage, safety and health, overtime, anti-discrimination, correct classification), or make employers accountable through litigation. Exit is more limited because of anti-poaching agreements, noncompetes, and generally higher unemployment, and the downward pressure on their wages is intensified by globalization, fissuring, and dominant buyer power. Increasingly, resistance is futile.

Our analysis, admittedly, does not rely only on pure causal estimates of each factor or guarantee that there are no interactions between the different determinants of wage growth. We offer our estimates as an informed summation of what existing research finds, and, crucially, we argue that any interaction effects are at least as likely to amplify the effects of policy levers as they are to dampen them.

So, while we conclude that these policy levers can account for the vast majority of the rise of wage inequality and the

productivity-median hourly compensation divergence we are not wedded to any specific number. We imagine that any quibbles with our estimates would still leave policy factors explaining a clear majority. We look forward to others offering alternative estimates of these factors and associated aggregations or to offering an alternative narrative with corresponding empirical evidence. But the simple existence of possible interactive effects does not mean that our results will clearly shrink – they may well rise—or that policy levers did not drive wage suppression.

The lessons here are simple. Wage growth has been greatly directed by policy decisions and is a political variable. It responds — robustly — to big policy changes. But for decades these policy decisions have gone in the wrong direction. Policymakers can deliver prosperity to the vast majority of U.S. workers based on faster wage growth. Whether workers obtain a fair share of the economy's gains in the future will depend not so much on abstract forces beyond their control but on demanding that their political representatives restore bargaining power to workers, individually and collectively.

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Appendix A: Data Definitions and Sources

Average hourly compensation: compensation equals wages and salaries and benefits. Benefits are the sum of Health Benefits and ‘Non-health benefits’ [‘Total compensation’ (Nominal, NIPA 6.2A-D line 1) - ‘Health benefits’ Wages and salaries (NIPA 6.3A-D line 1) deflated by CPI-U-RS. Compensation is divided by ‘Total hours’ (NIPA 6.9B-D) to obtain real hourly compensation.

Average hourly compensation (production/non-supervisory workers): Average hourly earnings (AHE) of production/non-supervisory workers is from: BLS, series ID = CEU0500000008 and for years 1947–1963, series ID = EEU005000006 for historical AHE. Production/non-supervisory worker compensation obtained by multiplying real average hourly earnings by the compensation-wage ratio.

Compensation-to-wage ratio: the ratio of real compensation (wages and salaries plus health and non-health benefits) to real wages and salaries.

Consumer prices: measured as changes in the CPI-U-RS index, <https://www.bls.gov/cpi/research-series/r-cpi-u-rs-allitems.xlsx>

Gross productivity: gross output provided in unpublished BLS Total Economic

Productivity (TEP) “Labor productivity”, which matches GDP in NIPA data. Hours worked from TEP data. Gross productivity growth is growth of gross output per hour.

Health benefits: Nominal health benefits (NIPA 6.11A-C line 30, NIPA 6.11D line 32) are inflation adjusted by a constructed health inflator: CPI-U-RS times PCE Health (NIPA 2.5.4 line 37) / PCE total (NIPA 2.5.4 line 1). The PCE health deflator is used because it more fully captures health costs than the CPI health deflator which only captures out-of-pocket costs.

Median hourly wage: Economic Policy Institute analysis of Current Population Survey (CPS) Outgoing Rotation Group (ORG) microdata, as presented in the State of Working America Data Library.

Median hourly compensation: real median hourly wage multiplied by the compensation-wage ratio (see: Average hourly compensation (production/non-supervisory workers))

Net productivity: Gross output converted to net output by multiplying the ratio of net-to-gross domestic product ratio [NDP (NIPA 1.7.6 Line 4), GDP (NIPA 1.7.6 line 1)]. Net productivity presented deflated by output prices, i.e. implicit price deflator of Net Domestic product (NDP) and also by consumer prices (CPI-U-RS).

National Income and Product Accounts (NIPA): Department of Commerce, Bureau of Economic Analysis: <https://apps.bea.gov/iTable/iTable.cfm?reqid=19step=2reqid=19step=2isuri=11921=survey>

Wedges between median hourly compensation and productivity

- **Total net productivity-median hourly compensation divergence:** this is what the decomposition explains. It is the difference between growth of real net productivity (at output prices) and real median hourly compensation.
- **Inequality of compensation:** difference between growth of real average hourly compensation and real median hourly compensation.
- **Loss in labour's share of income:** difference between growth of net productivity growth (at consumer prices) and real average hourly compensation.
- **Divergence of consumer and output prices:** difference between net productivity growth (at output prices) and net productivity growth (at consumer prices).