Regional Spotlight

Wage Inequality Across the U.S.

Wage inequality dipped after COVID, but longer-term regional inequality trends remain unchanged.

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The Great Recession and the COVID-19 pandemic were two of the most significant economic disruptions since the Great Depression, and each altered the dynamics of wage inequality. After the Great Recession, wage inequality grew, continuing the decades-long trend of a widening wage gap between high and low earners. But the unique economic conditions brought on by the COVID-19 pandemic led to a slight decline in wage inequality.

An important aspect of these differing effects is the wide variation in wage inequality across U.S. metro areas. Large urban areas tend to have higher wage inequality, driving much of the growth in wage inequality for the nation.[1] This growth accelerated in the years immediately following the Great Recession but declined slightly after the pandemic. Although wage inequality continued to rise after the pandemic for many large, often coastal cities where wage inequality had already been highest, smaller cities away from the coasts saw wage inequality decline, which led to the slight, nationwide decline in wage inequality.

These regional and metro-level differences in wage inequality

are creating diverging economic outcomes not only for households within regions but also between regions throughout the country. Recognizing this divergence can help us formulate public policies to better address inequality. To further our understanding of these regional differences, I first explore the long-term trend in rising wage inequality. I then show how wage inequality rose across the country after the Great Recession and examine where and how wage inequality declined after COVID.

The Long-Term Trend

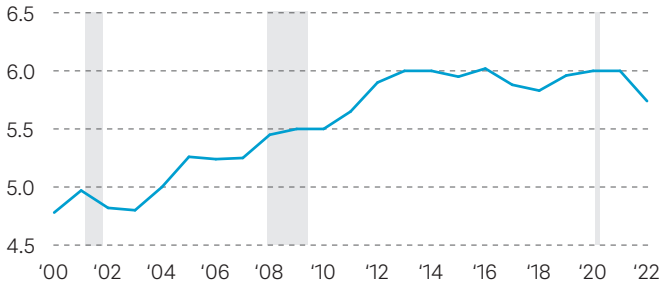
Rising wage inequality is not a recent phenomenon. The demand for highly skilled workers has increased significantly since the 1980s as globalization and the adoption of technology have boomed, driving disproportionately strong growth in wages for highly skilled workers.[2] These factors have also led to an increase in *job polarization*—an increase in employment in low- and high-skill occupations relative to mid-skill occupations. Because low-skill jobs tend to be low-paid, and high-skill jobs highly paid, job polarization concentrates employment toward the extreme ends of the wage distribution, which contributes to the rise in wage inequality.

One way to measure this trend, and a common measure of wage inequality, is to look at the ratio of the 90th percentile wage to the 10th percentile wage, or the 90/10 ratio. In 2005 the 90/10 ratio in the U.S. was 5.3 (Figure 1). This means a worker in the 90th percentile earned 5.3 times as much as a worker in the 10th percentile.[3] By 2022, the 90/10 ratio had risen to 5.7. For comparison, between 1980 and 2000 the 90/10 ratio rose from 4.2 to 4.8.

FIGURE 1

One Common Measure of Wage Inequality Shows a Rising Trend

The ratio of the 90th percentile real wage to the 10th percentile real wage in the U.S., 2000–2022



Data Source: U.S. Census Bureau's American Community Survey (ACS)

Note: Wages have been adjusted using the Personal Consumption Price Index.

However, changes in the 90/10 ratio show that wage inequality did not rise at a constant pace from 2005 to 2022. In the years immediately following the Great Recession, real wage growth was relatively modest for the median worker and those in the top half of the wage distribution, whereas real wages at the bottom of the distribution declined through 2013, driving the 90/10 ratio higher (Figure 2). As of 2013 the 90/10 ratio was 6.0.

But from 2014 to 2018, the 90/10 ratio shrank slightly as those toward the bottom of the wage distribution experienced accelerating growth in real wages. By 2018 the ratio was back down to 5.8.[4]

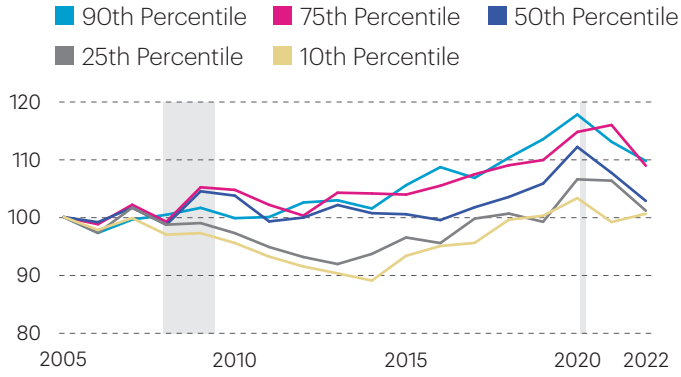
Then, in the years leading up to the pandemic, the 90/10 ratio rose again, reaching 6.0 in 2020. So, despite the occasional decline in the 90/10 ratio, the overall trend has been toward growing wage inequality over the past 40 years.[5]

FIGURE 2

Real Wage Growth Was Modest for the Median and Higher-Paid Workers After the Great Recession

But real wages at the bottom of the distribution declined, driving the 90/10 ratio higher.

Real wages of full-time workers by percentile, indexed to 2005, 2005–2022



Data Source: U.S. Census Bureau's American Community Survey (ACS)

Note: "Full-time" is defined as working at least 40 hours a week and at least 50 weeks a year.

Regional Differences During and After the Great Recession

Wage inequality rose almost everywhere in the U.S. during and after the Great Recession, but the level of inequality varied widely throughout the country. To show these regional differences and examine where inequality rose most, I calculated and compared the 90/10 ratios for full-time workers in more than 200 consistently defined metropolitan statistical areas (MSAs) for 2005 and 2019.[6] I found that wage inequality tended to be higher in larger urban areas.[7] Many of the MSAs where the ratio was highest were in the Northeast, on the West Coast, in Texas, and in Florida (Figure 3). These regions have large concentrations of occupations in traditionally high-skill and high-wage industries like tech and finance, as well as low-skill and low-wage industries (Figure 4).[8]

Meanwhile, MSAs in the Rust Belt tend to have greater wage *equality*. Although some MSAs within this region have been impacted in recent decades by the declining importance of manufacturing, by automation, and by the agglomeration of high-skill jobs in the nation's largest cities, manufacturing remains important in many MSAs, and accounts for a much larger share of employment than in the nation overall.[9] This concentration of jobs in a single, traditionally middle-wage sector leads to a flatter

FIGURE 3

MSAs with a Large Concentration of Highly Skilled Workers Have a Higher 90/10 Ratio

Many of these cities are in regions with many tech and finance jobs, which tend to require high skills.

The 90/10 ratio, by metropolitan statistical area (MSA), 2019

Data Source: Author's calculations based on U.S. Census Bureau's ACS

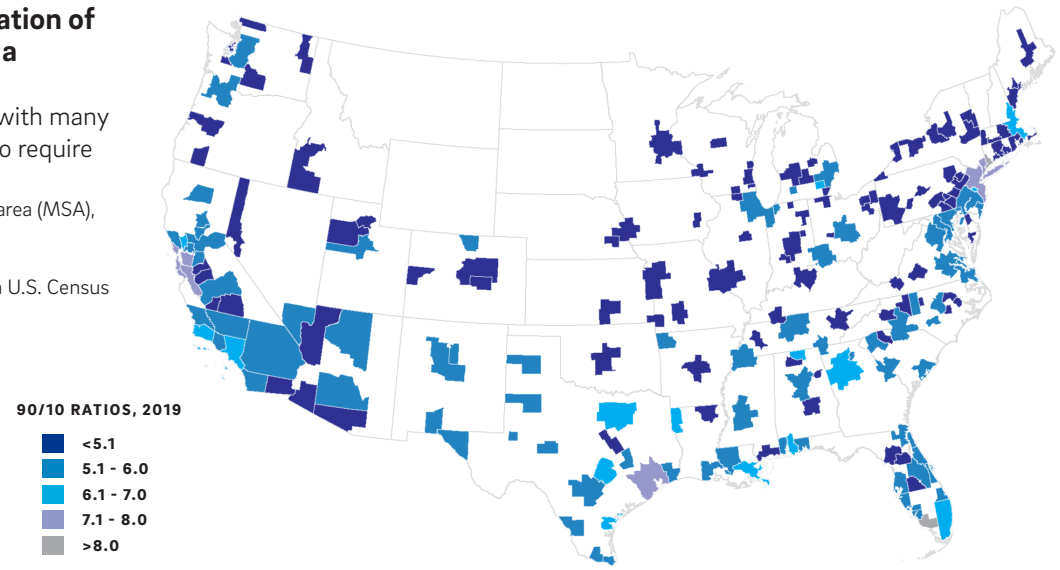
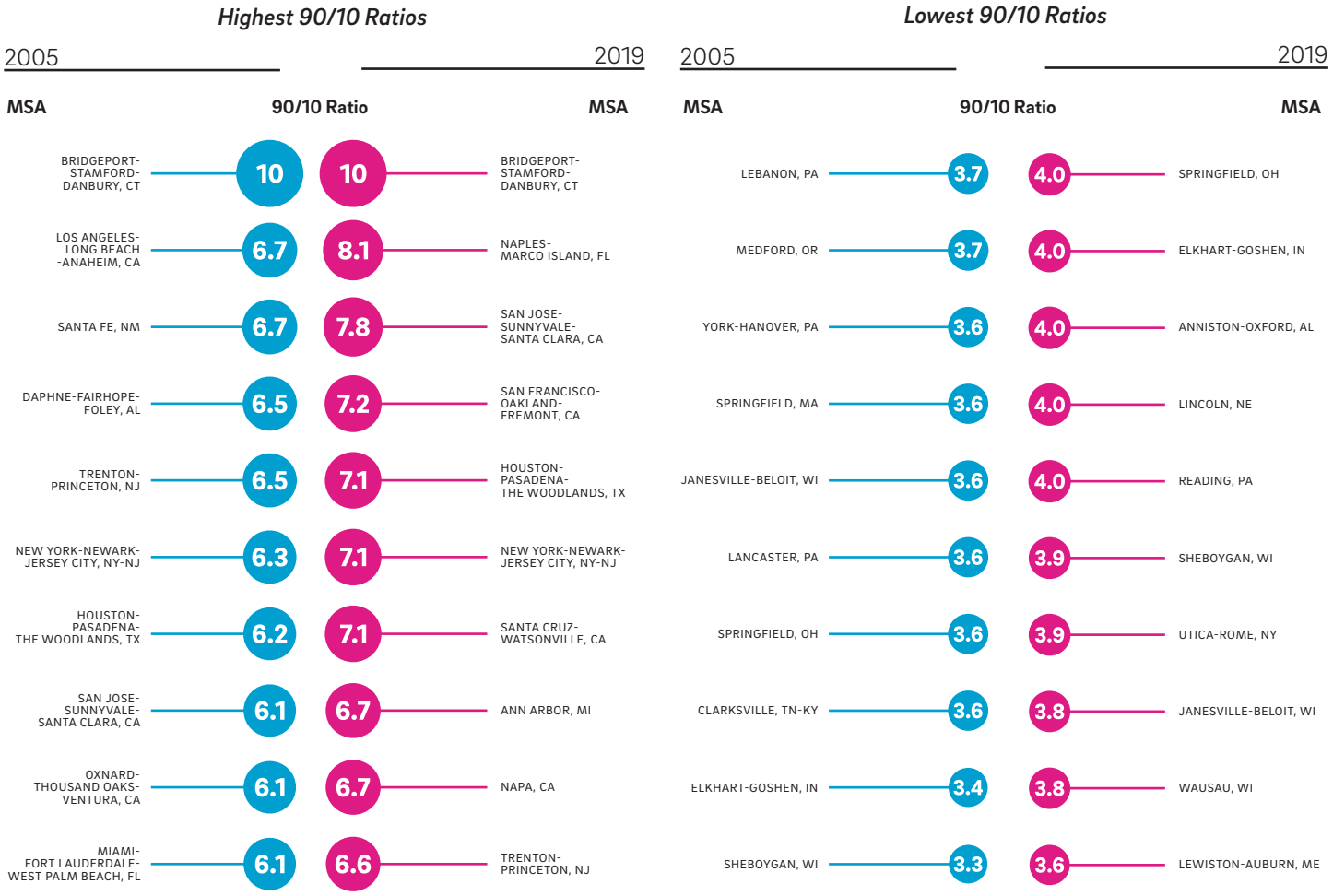


FIGURE 4

Rust Belt and Midwest MSAs Tend to Have Greater Wage Equality

Some of these MSAs still depend on the traditionally middle-wage industry of manufacturing, which flattens their wage distribution.

Top 10 and bottom 10 MSAs by 90/10 ratio, 2005 and 2019



Data Source: Author's calculations based on U.S. Census Bureau's ACS

wage distribution—and thus lower wage inequality—throughout much of the Rust Belt.

From 2005 to 2019, increasing wage inequality in the high-ratio MSAs was driven by a combination of rising real wages for already highly paid workers, mostly stagnant real wages for low-paid workers, and a rise in job polarization. In most high-ratio areas, wage growth at the bottom of the wage distribution was mostly flat or even declining while wages grew sharply in the top half of the distribution. By contrast, MSAs with the lowest 90/10 ratios in 2019 usually had a relatively flat wage distribution. As in other MSAs, lower-earning workers in these areas experienced modest or flat wage growth from 2005 to 2019, but because these MSAs did not have the high concentration of highly paid jobs found in the largest MSAs, the top half of their distribution did not experience a sharp rise in wages.

*See **Wage Inequality Across the Third District***

Wage inequality tends to rise faster in larger cities for several reasons. First, larger cities tend to have an agglomeration of high-skill jobs. As technology matures, firms' need to fill these jobs increases faster than the supply of highly skilled workers.[10] With demand exceeding supply, wages for these workers increase.

Second, firms in larger cities tend to be more productive, at least in part due to labor market pooling, input sharing, and knowledge sharing among the many highly skilled workers concentrated there.[11] And more-productive workers are usually paid more.

Third, high-skill workers have migrated toward larger cities, drawn by their high wages and better amenities.[12] As a result, smaller cities and rural areas lose potentially higher-wage workers.

Fourth, large cities tend to attract low-wage workers due to immigration patterns, better access to public transportation, and extreme skill complementarity.[13]

And fifth, automation and international trade have pushed urban non-college-educated workers into lower-skilled jobs, leading to lower wages for these workers.[14]

Wage Inequality After COVID

Despite the large labor market disruptions at the start of the COVID-19 pandemic—particularly for the bottom of the wage distribution—wage inequality declined, with the country's 90/10 ratio dipping from 6.0 in 2019 to 5.7 in 2022. This decline was primarily driven by weakening real wage growth for the highest earners as well as a declining supply of and increasing competition for low-paid workers, which together flattened the wage distribution.[15]

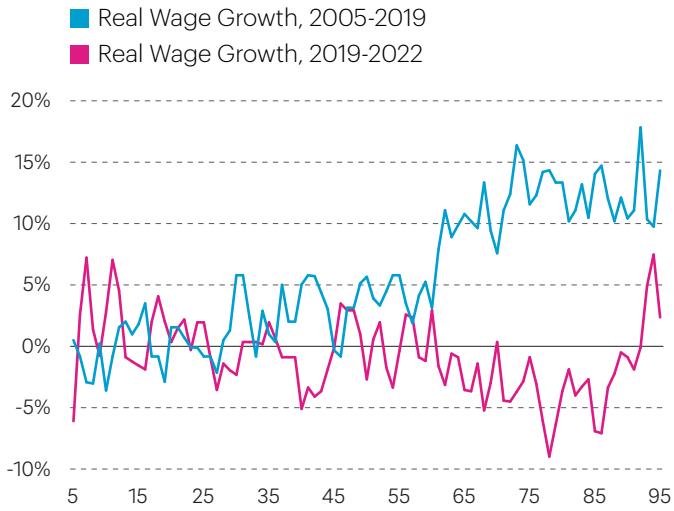
Workers in the top 40 percent of the distribution experienced flat or declining real wage growth from 2019 to 2022 (Figure 5). This compares to real wage growth of between 10 and 15 percent from 2005 to 2019. For low-wage workers, an inverse pattern prevailed. Although low-wage workers were especially impacted by job losses early in the pandemic, the inability of firms to find low-wage labor once demand recovered created upward wage pressure for low-wage jobs. This led to modest real wage growth for workers in the bottom quarter of the distribution. From 2019 to 2022, their real wages grew as much as they had from 2005 to 2019.

FIGURE 5

Higher-Paid Workers Experienced Flat or Declining Real Wage Growth During the Pandemic

The inability of firms to find low-wage labor created modest wage growth for lower-paid workers.

Real wage growth by wage percentile, 2005–2019 and 2019–2022



Data Source: U.S. Census Bureau's American Community Survey (ACS)

Note: "Full-time" is defined as working at least 40 hours a week and at least 50 weeks a year. Wages have been adjusted using the Personal Consumption Price Index.

Just as wage inequality rose unevenly across the U.S. during and after the Great Recession, wage inequality fell unevenly during and after COVID. To show these differences I calculated the MSA-level 90/10 ratios for 2022 and compared them to the ratios for 2019. Most MSAs saw their 90/10 ratio decline from 2019 to 2022 (Figure 6). The Daphne-Fairhope-Foley, AL, metro area experienced the largest decline, falling from 6.5 in 2019 to 5.2 in 2022, followed by the Ann Arbor, MI, and Prescott, AZ, MSAs, where it fell from 6.7 to 5.5 and 5.1 to 3.9, respectively.

Why did these three MSAs see the biggest decline in their 90/10 ratio? Ann Arbor may be an outlier: It has a much larger-than-average share of employment in educational instruction and library occupations. Many of these well-paid jobs were likely impacted by the University of Michigan's salary freeze in the 2020-2021 fiscal year, contributing to the slower wage growth experienced at the top of the wage distribution. This slower growth, combined with modest to strong wage growth at the bottom of the wage distribution, led to a large decline in Ann Arbor's 90/10 ratio.[16]

The situation in the Daphne-Fairhope-Foley, AL, and Prescott, AZ, MSAs may be more indicative of national trends. Both of these MSAs have a larger-than-average share of total employment in the traditionally low-wage food services industry.[17] According to the Bureau of Labor Statistics (BLS), accommodation and food services firms were the most likely to increase pay

in 2021 and increase starting pay to attract new hires in 2022.[18] These increases likely drove the rise in real wages experienced at the bottom of the wage distribution in these two MSAs.

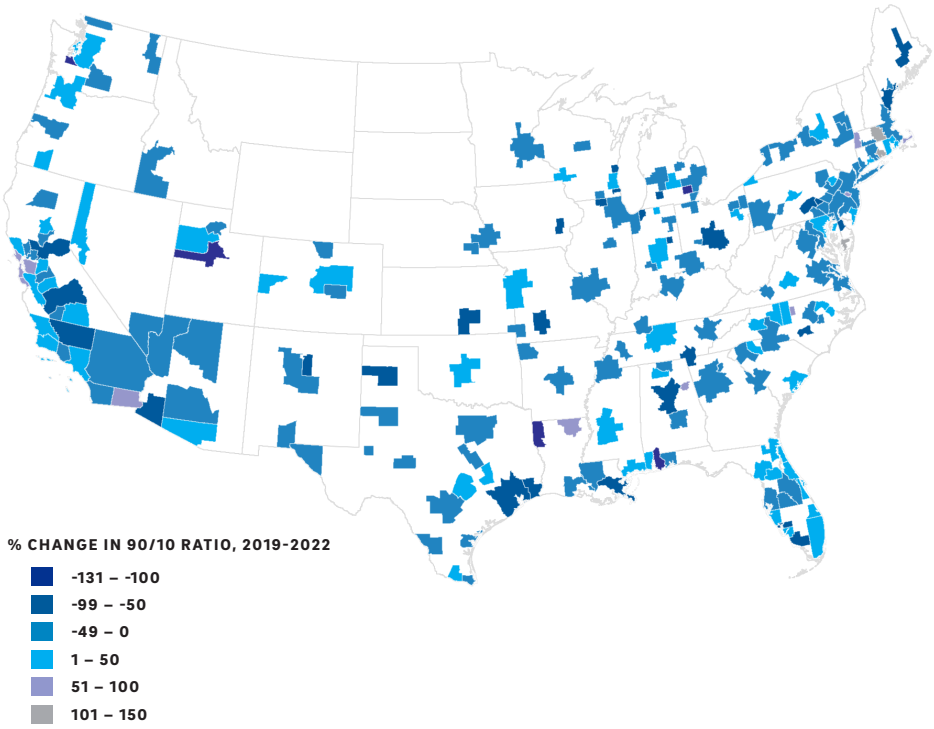
However, inequality did not decline in all MSAs. In 77 MSAs, the 90/10 ratio *rose* from 2019 to 2022. Increases in the 90/10 ratio were most concentrated in the West, the Northwest, and Florida—all three of which had high wage inequality prior to the pandemic. In all three, wage inequality seems to have spilled out of the biggest cities, perhaps because high-earning workers were moving into surrounding communities to take advantage of remote-work opportunities. Overall, MSAs that experienced an increase in wage inequality were concentrated in regions that already had higher wage inequality.

FIGURE 6

Wage Inequality Did Not Decline Uniformly Across the U.S. During and After COVID

MSAs where wage inequality increased were concentrated in regions that already had higher wage inequality.

Change in the 90/10 ratio by MSA, 2019–2022



Data Source: Author's calculations based on U.S. Census Bureau's ACS

Wage Inequality Across the Third District

As is true in the U.S., wage inequality grew in the Third District after 2005. In aggregate, the Third District's 90/10 ratio rose from 4.8 in 2005 to 5.2 in 2019, before declining to 4.9 in 2022.[20] Despite the District's small size, wage inequality varies widely across the region (Figure 7).

The Trenton–Princeton, NJ, metro area had the highest 90/10 ratio among Third District MSAs, at 7.5 in 2022, well above the Atlantic City–Hammonton, NJ, and Philadelphia–Camden–Wilmington, PA-NJ-DE-MD, metro areas, which were the next highest, at 5.6 and 5.5, respectively.[21] The Lebanon, PA, metro area's 90/10 ratio of 3.7 was the lowest in the district.

Of the 16 MSAs in the Third District where data are available, 12 saw their 90/10 ratio increase from 2005 to 2022. However, in only five metro areas (Trenton–Princeton, NJ, Atlantic City–Hammonton, NJ, Philadelphia–Camden–Wilmington, PA-NJ-DE-MD, Erie, PA, and State College, PA) did the ratio rise more than it did in the U.S. Four of the MSAs (Dover, DE, Johnstown, PA, Scranton–Wilkes-Barre, PA, and Reading, PA) saw their inequality ratios decline over the same period. In 11 MSAs in the Third District, wage inequality declined from 2019 to 2022, and in five of those areas the 90/10 ratio fell more than it did in the U.S.

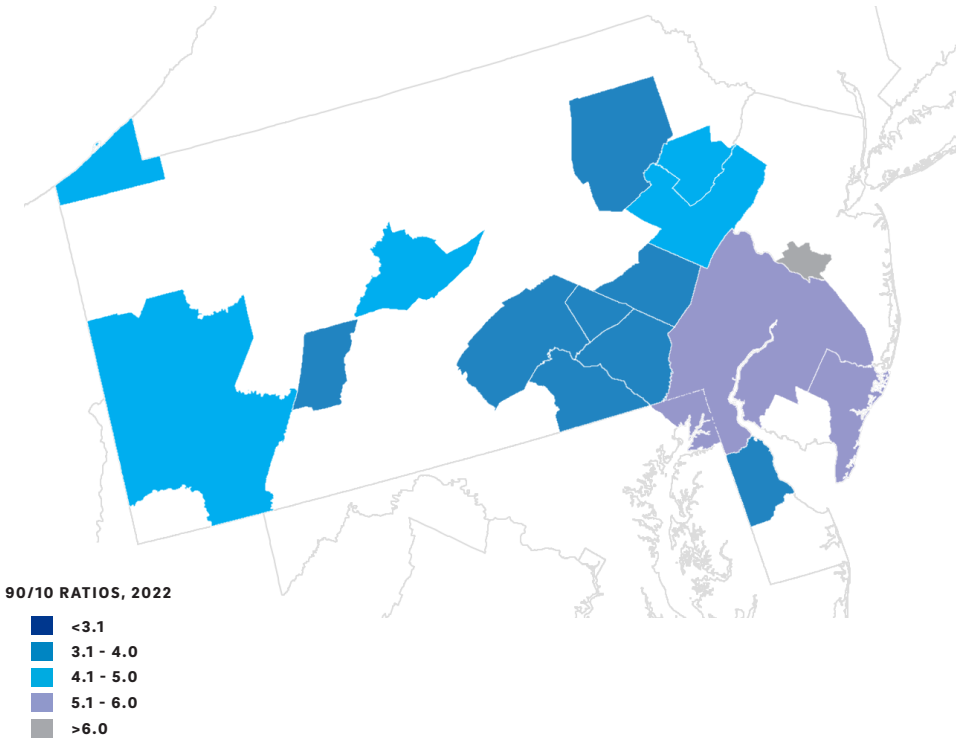
The Philadelphia–Camden–Wilmington, PA-NJ-DE-MD, MSA ranked as the 46th most unequal metro area in 2022, with a 90/10 ratio of 5.5. This was up from 4.7 in 2005, when it ranked 89th.

FIGURE 7

Wage Inequality Varies Widely in the Third District Despite Its Small Size

The 90/10 ratio of Third District MSAs, 2022

Data Source: Author's calculations based on U.S. Census Bureau's ACS



Conclusion

The Great Recession and the COVID-19 pandemic were two of the largest labor market disruptions in history. Concurrently, wage inequality, as measured by the 90/10 ratio, rose in the U.S. and across most metro areas. However, this rise was not linear. During and immediately after the Great Recession, real wages were flat or declined for the lowest-paid workers while real wages grew faster for the highest paid. This accelerated the increase in wage inequality. During the pandemic, it was real wages for those at the bottom of the wage distribution that increased faster. As a result, wage inequality slightly declined immediately after the pandemic.

However, this decline did not benefit all low-wage workers. Total income inequality, which includes taxes and transfers in addition to wage income, rose again in 2022 as stimulus payments and temporary expansions of tax credits expired.[19] Low-wage workers were also more likely to lose their jobs early in the pandemic. They thus missed out on wages and possible wage gains. And wage inequality remained largest in the more-populous metro areas, particularly those with a high concentration of tech and finance occupations.

The unique economic conditions brought on by the COVID-19 pandemic and the elevated inflation environment that led to a decrease in wage inequality may soon dissipate. Furthermore, the ever-growing demand for highly skilled workers and increasing adoption of new technologies mean that the long-term increase in wage inequality may reemerge.

The increase in wage inequality is leading to diverging economic outcomes for households between and within U.S. metro areas. When shaping policy decisions, policymakers need to account for the magnitude of wage inequality and the regional differences associated with it. If they don't, the continuing divergence of economic outcomes will make it increasingly hard to implement policies that work for everyone EI.

Notes

1 See Baum-Snow and Pavan (2013).

2 See Acemoglu and Autor (2011).

3 All 90/10 ratios throughout this article incorporate the 90th percentile real wage and the 10th percentile real wage of full-time workers only. "Full-time" is defined as working at least 40 hours a week and at least 50 weeks a year. All wage data are from the U.S. Census Bureau's annual American Community Survey (ACS) and have been adjusted using the Personal Consumption Price Index.

4 Autor, Dube, and McGrew (2023) show more significant wage gains for lower-wage earners over this period, but their sample includes part-time workers, who tend to earn less than full-time workers.

5 The U.S. Department of Commerce (2023) also shows that geographic income inequality (defined as the variation in average income across all places in the nation) has risen more than 40 percent over the same period.

6 MSAs are delineated by the U.S. Office of Management and Budget.

7 This confirms what Baum-Snow and Pavan (2013) found: The growth of inequality in larger cities explains over one-quarter of the rise in inequality nationwide from 1980 to 2007.

8 A couple of smaller MSAs with the highest 90/10 ratios are "college towns." These MSAs tend to have a high level of wage inequality because university staff are typically better paid than other residents. See the U.S. Bureau of Labor Statistics' Occupation Employment and Wage Statistics (OEWS).

9 See the U.S. Bureau of Labor Statistics' OEWS.

10 See Abel and Deitz (2019).

11 See Rosenthal and Strange (2004), Baum-Snow, Freedman, and Pavan (2018), and Davis and Dingel (2019).

12 See Diamond (2016).

13 See Albert and Monras (2022), Glaeser, Kahn, and Rappaport (2008), and Eeckhout, Pinheiro, and Schmidheiny (2014). Extreme skill complementarity refers to the complementary relationship between high- and low-skill workers. For example, high-skill (and thus higher-wage) workers' demand for amenities and services creates demand for low-skill (and thus lower-wage) employment in the local service sector.

14 See Autor (2019).

15 See Autor, Dube, and McGrew (2023).

16 For data on the shares of employment, see the U.S. Bureau of Labor Statistics' OEWS. For more on the wage freeze, see Stocking (2021)

17 See U.S. Bureau of Labor Statistics' OEWS.

18 See Bureau of Labor Statistics' Business Response Survey (2021, 2022).

19 See Creamer and Unrath (2023).

20 These 90/10 ratios cover 16 Third District MSAs where data were available.

21 Trenton-Princeton, NJ, is another example of an MSA with a high level of wage inequality in part due to a large population of university staff who are typically better paid than other residents.

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