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Low wages aren't a growing problem

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Low Wages Aren't a Growing Problem

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New Working Paper Series No. #322

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August 2022*

Abstract

Statements by high-profile political figures and supporting academic research have led to a common perception of worsening job prospects for low-wage workers in the US. In this paper, we show that since the early 1980s there has been a decline in the share of workers earning low wages. This holds across sub-populations and across thresholds for determining what constitutes a low wage. Much of the decline occurs over two periods: the late 1990s and the late 2010s. The decline is greater and steadier for women than for men. We further show that the worker-level persistence of low wages has not increased, and has likely decreased, over time.

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1 Introduction

In an era of increasing polarization, Americans of all political persuasions generally agree that economic conditions of those earning the least have worsened in recent years. Former president Donald Trump blames these worsening conditions on low-skill immigrants and the loss of manufacturing jobs to foreign competition from NAFTA nations and China. Senator Elizabeth Warren blames these worsening conditions on the erosion of unions and worker power and proposes policies that extend labor rights to all workers and increase the minimum wage to $15. Andrew Yang argues that "good jobs are becoming more and more scarce" due to automation, the process in which workers are replaced by robots and machines, and as a solution advocates for Universal Basic Income.

These ideas are not limited to political campaigns. There is economic evidence supporting each of these claims: import competition reduces manufacturing wages (Autor, Dorn and Hanson (2013)); automation polarizes the labor market and pushes low-skill workers into low-paying jobs (Autor and Dorn (2013)); unions raise the wages of low-skill workers (Card (1996)) and therefore we should expect the decline of unions to result in declining wages for low-skill workers; declines in the real minimum wage increase income inequality by depressing wages at the bottom of the wage distribution (Autor, Manning and Smith (2016)); there is an active debate on the role of low-skill immigration and much of this research suggests that low-skill immigration depresses low-skill wages (Borjas (2003), Card (2009), Dustmann, Schönberg and Stuhler (2016)).

These statements by high-profile political figures and the supporting academic research have led to a common perception of worsening job prospects for low-wage workers in the US. A recent report by the Brookings Institution (Ross and Bateman (2019)), which provides a demographic breakdown of low-wage workers, argues that "low-wage workers risk becoming collateral damage, struggling to find their footing in the labor market and an educational system riddled with inequities." In their introductory remarks to the published proceedings of the Securing Our Economic Future conference, Kearney and Ganz (2020) express a similar sentiment: "The promise that hard work and determination will yield economic success is a central American ideal, but it has been called into question as secular economic forces and institutional changes have reshaped the American economy and had an uneven impact on Americans' ability to prosper."[1]

[1] In the same proceedings, Sacerdote (2020) argues that the decline of the middle class is exaggerated due to overstated inflation, and in addition provides evidence that consumption has increased across the income distribution.

In this paper, we show that since the early 1980s, there has been a significant decline in the share of workers earning low wages. For our baseline results, a worker is classified as a low-wage earner if they earn a real hourly wage below $15 (constant 2019 US Dollars). We find that at the start of 1985, there were 36.5 million low-wage workers out of a total of 88.2 million total workers (41 percent). At the end of 2019, there were 36.7 million low-wage workers out of a total of 132 million total workers (28 percent). Remarkably, there has been little to no increase in the number of low-wage workers since the mid-1990s despite a large increase in the total number of workers.

There are alternative ways of defining a threshold for low wages, such as thresholds proportional to the poverty line and thresholds proportional to the median hourly wage. These alternatives show either a decrease or no noticeable change in the share of workers earning low wages. There are, however, other thresholds for low wages that suggest a worsening of conditions for low-wage workers. Most notably, comparisons to the wages of top earners show low-wage earners losing ground. However, these comparisons to top earners don't identify the worsening of conditions specific to low-wage workers: when compared to top earners, all other workers are losing ground.

One way to access the economic condition of low-wage earners that does not depend on a particular threshold for low wages is to compare wage growth at the bottom of the wage distribution to wage growth at the middle and at the top of the wage distribution. If the conditions of low-wage workers have worsened, then we should expect to see wage growth at the bottom of the wage distribution lagging behind. Instead, we find that wages have grown much faster at the bottom of the wage distribution (the bottom third) than at the middle of the wage distribution (the middle third), and have grown fastest at the top of the wage distribution. Wages at the 30th percentile grew in line with those at the 70th percentile, and real wages below the 30th percentile grew even faster. Therefore, unless we are willing to argue that the conditions have worsened at the 70th percentile (which translates into a 2019 annual income of just under $60k for a full-time employee), we should not assert that conditions have worsened at the 30th percentile.

Even though there has been a decline in the share of workers earning low wages, it is still possible that more people today are getting stuck in low-wage jobs than in the past. Perhaps in the past low-wage jobs were a temporary starting point for young workers and those re-entering the labor force, but today many more workers stay in these low-wage jobs for prolonged periods of time. In other words, perhaps low wages have grown more persistent over time. To address this

possibility, we use data from the Panel Study of Income Dynamics (PSID) to track the same set of workers over time and measure the probability that a low-wage worker moves to a higher pay bracket. Across time horizons and sub-populations we find that the persistence of low wages has not increased, and has likely decreased, over time.

A potential explanation for the decline in the share of workers earning low wages is the increase in educational attainment of US workers. Since the 1980s, the share of workers with less than a high school education has declined and the share of workers that completed a college education (or more) has greatly risen. This increase in educational attainment should result in higher wages and a lower share of workers earning low wages.

To assess the role of educational attainment, we provide two sets of results that hold fixed the distribution of demographic characteristics of US workers, including educational attainment, at their 1985 values. These adjustment have the effect of greatly increasing the sample weights in recent years of less-educated workers (who are less common today than in the past and therefore we need to increase their weight in order to match the 1985 distribution), and greatly decreasing the sample weights of highly educated workers.

After adjusting the sample weights in each year to match the demographic characteristics of US workers in 1985, we repeat our analysis. Not surprisingly, these adjustments shift down the level of the wage distribution in recent years and greatly reduce the downward trend in the share of workers earning low wages. However, even with these adjustments, we find a modest decline in the share of workers earning low wages.

More importantly, these adjustments that hold fixed the distribution of demographic characteristics of US worker don't disproportionately reduces wages at the bottom of the wage distribution. The opposite is true: the adjustments disproportionately reduces wages at the top of the wage distribution. Real wage growth at the 30th percentile is reduced by 15 percentage points (from 15% to 0%). This is similar in magnitude to the decline in real wage growth in the middle of the wage distribution (middle third) and is less than the decline at the top of the wage distribution (top third). Even with the adjustments, real wage growth at the bottom of the wage distribution is higher than in the middle of the distribution and is in line with wage growth at the top.

Another potential explanation for the decline in the share of workers earning low wages is the expansion of state minimum wage laws. While the federal minimum wage in real terms is no higher

today than it was in the early 1980s,[2] many states have since set a minimum wage that exceeds the federal minimum wage. Back in 1985, only Alaska and Connecticut had a state minimum wage that exceeded the federal minimum wage. In both cases, the difference between the state and federal minimum wage was modest (0.6% in Connecticut and 15% in Alaska). By the end of 2019, 28 states had a state minimum wage that exceeds the federal minimum wage and this reaches as high as $14 per hour in the District of Columbia and $13 per hour in Washington state.

To assess the role of state minimum wages in the decline in the share of workers earning low wages, we provide separate calculations for different US geographic areas. If high state minimum wages have led to the decline, we would expect to see greater declines in geographic areas with higher minimum wages. We find significant declines in the share of low-wage earners in all census regions (Northeast, Midwest, South, and West) and the largest declines occurred in the South and Midwest, where state minimum wages tend to be low. When we split states into high minimum wage states ($10 or higher) and low minimum wage states (below $10), we find that both groups of states show a significant decline in the share of low-wage earners, and low minimum wage states experience greater declines.

The remainder of this paper proceeds as follows. Section 2 describes the data. Section 3 presents the results. Section 4 presents evidence on the roles on educational attainment and the minimum wage on driving the decline in the share of workers earning low wages. Section 5 concludes.

2 Data

For the purpose of measuring the share of the population earning low wages, we use monthly data from the Outgoing Rotation Groups (ORG) extracts from the Current Population Survey (CPS) over the period 1979–2019.[3] Unlike other data from the CPS, the ORG survey explicitly collects weekly and hourly information on wages, pay, and hours worked. Moreover, the wage data are based on recent weeks rather than a full year, thus mitigating the problem of recall bias. We have also repeated the analysis using the more commonly used March Supplement (ASEC) to the CPS

[2] The nominal federal minimum wage in 1985 was $3.35, which is equal to $7.96 in constant 2019 US Dollars after deflating by the CPI. This is nearly 10% higher than the 2019 federal minimum wage of $7.25.

[3] Access to the data and extensive documentation are available at the NBER website https://www.nber.org/research/data/current-population-survey-cps-merged-outgoing-rotation-group-earnings-data.

and both segments of the data show similar results.[4]

Our main sample consists of employed adults between the ages of 18 and 64. The majority of the sample report hourly wages. For salaried workers we construct hourly wages by dividing weekly earnings by usual weekly hours. To avoid clear data errors, we exclude a small number of observations that report a real hourly wage below $2 (2019 US Dollars).[5] We report additional results for the sample of full-time workers, which we define as working 35+ usual weekly hours. All statistics are calculated using the provided sample weights to ensure that they are representative of the national population.

Nominal dollars are deflated using the Consumer Price Index for All Urban Consumers (CPI-AUCSL). Our use of the CPI is conservative in the sense that alternative measures of the price level, such as the PCE, show lower annual inflation since the early 1980s. As a consequence, using alternative measures of the price level, such as the PCE, would lead us to estimate (1) the same number of workers earning low wages today, (2) many more workers earning low wages in the early 1980s, and therefore (3) a much larger decline in the share of workers earning low wages.[6]

For the purpose of measuring the persistence of low wages, we use data from the Panel Study of Income Dynamics (PSID) over the period 1979–2019.[7] Unlike the CPS, which is (almost entirely) a cross-sectional survey, the PSID track individual members of households over time and across generations.[8] The survey collects a wide variety of information on demographics, wages, employment, wealth, and other household characteristics. We use the PSID-provided measure of hourly wages, which they construct as the ratio of annual labor income divided by annual work hours. Similar to our treatment of the ORG data, we exclude observations that report a real hourly wage below $2 (2019 US Dollars). The design of the survey and limitations on our ability to merge the different survey datasets make it much easier to consistently track men than women. For this reason, when

[4]See Harvey and Bernstein (2003) for further details of the ORG segment and for a comparison of the ORG sample to the CPS March supplement.

[5]This restriction removes on average 0.16% of the sample per year. The results are similar if we do not impose this restriction.

[6]See Sacerdote (2020) for a discussion of the sources of bias in the CPI that lead to an overstatement of inflation and the consequences for measuring trends in real wages.

[7]Access to the data and extensive documentation are available at the University of Michigan Panel Study of Income Dynamics website `https://simba.isr.umich.edu/default.aspx`.

[8]In order to ensure the continued representativeness of the data while at the same time keeping a manageable sample size, the survey both adds new households and phases out some households that are the descendants of early survey participants. In addition, the survey displays significant attrition. See Becketti et al. (1988) and Fitzgerald, Gottschalk and Moffitt (1998) for detailed evidence of the representativeness of the PSID.

analyzing the persistence of low wages, we restrict our analysis to men. All statistics are calculated using sample weights.

3 Results

3.1 Share of Workers Earning Low Wages

Figure 1 presents the monthly counts of the total number of workers and the number of low-wage workers in the US. A worker is classified as a low-wage earner if they earn a real hourly wage below $15 (in constant 2019 US Dollars). The figure clearly shows that the rate of increase in the total number of workers greatly exceeds the rate of increase in the number of low-wage workers. At the start of 1985, there were 36.5 million low-wage workers out of a total of 88.2 million total workers (41 percent). At the end of 2019, there were 36.7 million low-wage workers out of a total of 132 million total workers (28 percent). Remarkably, there has been little to no increase in the number of low-wage workers since the mid-1990s despite a large increase in the total number of workers.

Figure 2 presents the share of US workers that earn low wages. The values are volatile in the first years of the data (possibly due to high inflation and the 1980 recession), which makes it difficult to offer a comparison of the present day to the start of the sample. Notwithstanding this limitation, the figure shows a clear and significant decline in the share of workers that earn low wages. Much of the decline occurs over two periods: the late 1990s and the late 2010s.

Figure 3 presents the share of US workers that earn low wages for several sub-populations of workers. The top-left panel presents results for full-time workers, where full time is defined as working 35+ usual weekly hours. At any point in time, full-time workers are less likely to earn low wages compared to the complete sample of workers. Over time, there is a noticeable decline in the share of full-time workers that earn low wages and this mirrors the decline in the complete sample of workers presented in Figure 2. The figure further presents results for white workers, black workers, male workers, female workers, and white-male workers. Among these sub-populations, the decline in the share of low-wage earners is sharpest for women. For all of the sub-populations, if we compare the end of the sample to 1979, the share of workers earning low wages has not increased and in most cases has declined. For all of the sub-populations, the share of workers earning low wages is significantly lower today than at any point since the mid-1980s.

Clearly, there are alternative ways of defining a threshold for low wages. Above we presented results using a threshold of $15 per hour (in constant 2019 US Dollars). We the analysis using thresholds proportional to the poverty line and thresholds proportional to the median hourly wage and these show either a decrease or no noticeable change in the share of workers earning low wages. There are of course other thresholds for low wages and other labor-market indicators that suggest a worsening of conditions for low-wage workers. Most notably, comparisons to the wages of top earners show low-wage earners losing ground. However, these comparisons to top earners don't identify worsening economic conditions specific to low-wage workers: when compared to top earners, all other workers are losing ground.

Figure 4 presents the growth of real hourly wages for US workers from December 1985 to December 2019 for each hourly wage percentile.[9] If the economic condition of low-wage workers have worsened, then we should expect to see wage growth at the bottom of the wage distribution lagging behind. Instead, we find that wages have grown much faster at the bottom of the wage distribution (the bottom third) than at the middle of the wage distribution (the middle third), and have grown fastest at the top of the wage distribution. In line with the results of Autor and Dorn (2013), the figure provides clear evidence of labor market polarization, but not of worsening conditions at the bottom of the wage distribution.

This figure is also helpful for understanding how alternative thresholds for determining low wages are likely to affect our results. Since real wages have grown across the entire wage distribution, any threshold for low wages with a fixed real value (such as thresholds proportional to the poverty line) will lead us to conclude that there are fewer low-wage workers today than in the past. Similarly, because real wages have grown faster at the bottom of the wage distribution than in the middle of the wage distribution, thresholds for low wages based on median wages will also lead us to conclude that there are fewer low-wage workers today than in the past.

3.2 Persistence of Low Wages

We now turn to measuring the persistence of low wages. For a given time horizon H, persistence is defined as the share of low-wage workers in year T that continue to earn low wages in $T + H$.

[9] This analysis closely follows Katz and Murphy (1992) (who measure the growth of wages at each percentile of the wage distribution to analyze the determinants of the rising skill premium) and Autor and Dorn (2013) (who measure the growth in wages of each percentile of the skill distribution to provide evidence of US labor market polarization).

This construction requires that an individual is working in both T and $T + H$. For this reason, we present results for workers between the ages of 18 and 54 in year T. This ensures that the age distribution remains similar when we measure persistence at different time horizons.

Figure 5 presents the persistence of low wages for US male workers (ages 18 to 54) from 1979 to 2018. The four panels present results using the different time horizons $H \in \{2, 4, 6, 8\}$. For example, the first observation in the top-left panel shows that among the workers earning low wages in 1979, 58% continue to earn low wages two years later in 1981. Similarly, the first observation in the bottom-left panel shows that among the workers earning low wages in 1979, 52% continue to earn low wages six years later in 1985. Not surprisingly, the figure shows that the level of persistence tends to be lower at longer time horizons. More importantly, the figure clearly shows that the persistence of low wages has not increased, and has likely decreased, over time.

Figure 6 presents the persistence of low wages for young US male workers (ages 25 to 34) from 1979 to 2018. This analysis emphasizes the career prospects of young workers and better reflects current labor market conditions. In addition, the focus on young workers addresses several potential concerns, such as changes in the demographics of the PSID sample and possible bias due to early retirement. The figure clearly shows that the persistence of low wages among young workers has not increased, and has very likely decreased, over time.

Overall, our results show that the persistence of low wages has not increased over time, and has likely decreased. These results hold separately for both white and black workers. While at any point in time low-wage black workers are more likely than low-wage white workers to remain low-wage earners in the future (higher level of persistence), we find that over time the persistence of low wages has not increased for either white or black workers, and has likely decreased for both (trend of persistence).

4 The Roles of Education and the Minimum Wage

In this section, we study the potential roles of educational attainment and the minimum wage in driving the decline in the share of workers earning low wages.

4.1 Education

To assess the role of educational attainment in the decline in the share of workers earning low wages, we present two sets of results. Both attempt to hold fixed the distribution of demographic characteristics of US workers, including educational attainment, at their 1985 values. These adjustments have the effect of greatly increasing the sample weight in recent years of less-educated workers, and greatly decreasing the sample weight of highly educated workers. Not surprisingly, these adjustments shift the level of the wage distribution downwards in recent years. It is worth noting that these adjustments likely overstate the role of educational attainment, because as more workers attain higher levels of education, the average ability of workers in each education bin declines.

In our first set of results, we start by computing the share of workers earning low wages in eight sex–education bins. Figure 7 presents the share of workers that earn low wages for all interactions of sex (male and female) with education (less than high school, high school, some college, and college+). The figure shows that a growing percentage of workers with no more than a high school education earn low wages, especially among men. The figure shows little to no trend for men with at least some college, and small declines for women with at least some college.

We next aggregate the share of workers earning low wages in each of the eight sex–education bins by weighting them using their 1985 population weights. This aggregation is equivalent to adjusting the CPS micro-level sample weights by multiplying each observation's weight by the adjustment factor

$$\text{Adjustment Factor}_{s,e,t} = \frac{\text{Worker Population Share}_{s,e,1985}}{\text{Worker Population Share}_{s,e,t}}$$

where s indexes sex, e indexes education, t indexes time, and Worker Population Share$_{s,e,t}$ is the share of workers in year t that are of sex s and have educational attainment e.

Figure 8 presents the share of low-wage workers after we fix population shares of each of the eight sex–education bins at their 1985 values. The figure shows only a modest decline in the share of workers earning low wages form the early 1980s to the present. Compared to our baseline results (Figure 2), the results in this figure suggest that educational attainment can account for much of the decline in the share of workers earning low wages. At the same time, even when we hold fixed educational attainment, we still find a modest decline.

In our second set of results, we follow the semi-parametric approach of DiNardo, Fortin and

Lemieux (1996) (henceforth DFL) in order to adjust the sample weights to match the distribution of demographics in 1985. Specifically, we implement the DFL procedure using 64 bins that correspond to all interactions of sex (male and female), race (white and non-white), education (less than high school, high school, some college, and college+), and age (18–25, 26–35, 36–50, and 51–64).[10]

Figure 9 presents the growth of real hourly wages for US workers from December 1985 to December 2019 for each hourly wage percentile, after we implement the DFL re-weighting of the 2019 population to match the 1985 distribution of demographics. While our baseline results (presented in Figure 4) show 15% real wage growth at the 30th percentile, the DFL adjusted results show zero real wage growth at the same 30th percentile. In this sense, the DFL adjustments eliminate much of the gains in wages at the bottom of the wage distribution.

At the same time, the reduction in real wage growth caused by the DFL adjustments are not unique to the bottom of the wage distribution. It is still the case that real wages grew much faster at the bottom of the wage distribution (the bottom third) than at the middle of the wage distribution (the middle third). Even more striking, after the DFL adjustments, real wage growth at the bottom of the wage distribution now equals or even exceeds real wage growth at the top of the wage distribution (top third). After the DFL adjustments, real wages at the 30th percentile grew faster than at the 70th percentile and are now on par with wage growth at the 85th percentile.

From these results we conclude that, even after adjusting the sample weights to match the 1985 distribution of demographics, (1) there is still a modest decline in the share of workers earning low wages and (2) real wage growth at the bottom of the wage distribution is on par with or exceeds real wage growth at that of the top of the wage distribution. Therefore, unless we are willing to argue that (after adjusting for educational attainment) economic conditions have worsened over time at the 85th percentile of the wage distribution, we should assert that conditions have worsened at the 30th percentile or below.

4.2 The Minimum Wage

To assess the role of state minimum wages on the decline in the share of workers earning low wages, we provide separate calculations for different US geographic areas.[11] If high state minimum wages

[10] The results are similar when we use finer age bins, replace age with potential experience, exclude race covariates, include an indicator for urban residence, or include unionization.

[11] Data on state and federal minimum wages are taken from the US Department of Labor.

have led to the decline, we would expect to see greater declines in geographic areas with higher minimum wages.

Panel A of Figure 10 presents results for the four census regions (Northeast, Midwest, South, and West). All of the census regions show a significant decline in the share of low-wage earners. Comparing across regions, we find that the largest declines occurred in the South and Midwest, where state minimum wages tend to be low, and the smaller declines occurred in the Northeast and West, where state minimum wages tend to be high.

Panel B of Figure 10 presents results for two groups of states: those with a high minimum wage in 2019 ($10 or higher) and those with a low minimum wage (below $10). In line with the results for the census regions, both groups of states show a significant decline in the share of low-wage earners, and low minimum wage states experience greater declines.

In summary, our evidence suggests that state minimum wages have not played a significant role in the decline of workers earning low wages.

5 Conclusion

In this paper, we show that since the early 1980s there has been a significant decline in the share of workers earning low wages. This holds across several sub-populations and across thresholds for determining low wages. We further show that the worker-level persistence of low wages has not increased, and has likely decreased, over time.

Returning to where we started, there is a popular narrative stating that "work no longer pays" and for this reason policies are needed to improve the economic conditions of low-wage workers. We are not arguing for or against any particular economic policy. Indeed, there are today, as there were in the past, economic and political grounds for a range of policies designed to help low-wage workers.[12] That being said, our results clearly show that low wages are no more common and no more persistent than in the past and therefore proposed policies should not be justified on the grounds of worsening economic conditions for low-wage workers.

[12]For example, a recent body of research finds that economic distortions in the form of firm market power have reduced the wage growth of workers and in response some policy makers have called for increased antitrust enforcement as a way of promoting wage growth. See, for example, Barkai (2020), De Loecker, Eeckhout and Unger (2020), Autor et al. (2020), and Booker (2019).

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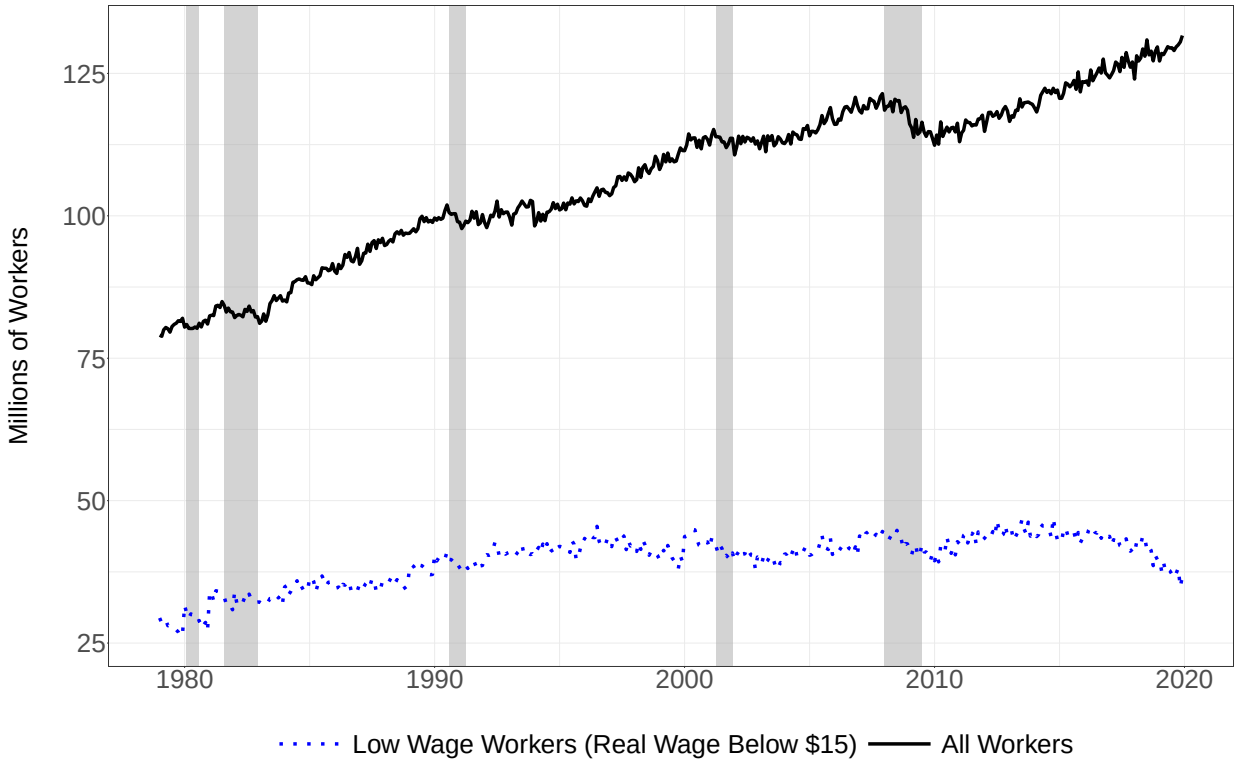


Figure 1: **Total Number of Workers and Low-Wage Workers**
The figure presents the monthly count of the total number of workers (ages 18 to 64) and the number of low-wage workers in the US. Data on employment and wages are taken from the Current Population Survey (CPS) Outgoing Rotation Group (ORG). A worker is classified as a low-wage earner if they earn a real hourly wage below $15 (2019 US Dollars). Nominal dollars are deflated using the Consumer Price Index for All Urban Consumers (CPIAUCSL). All statistics are calculated using sample weights.

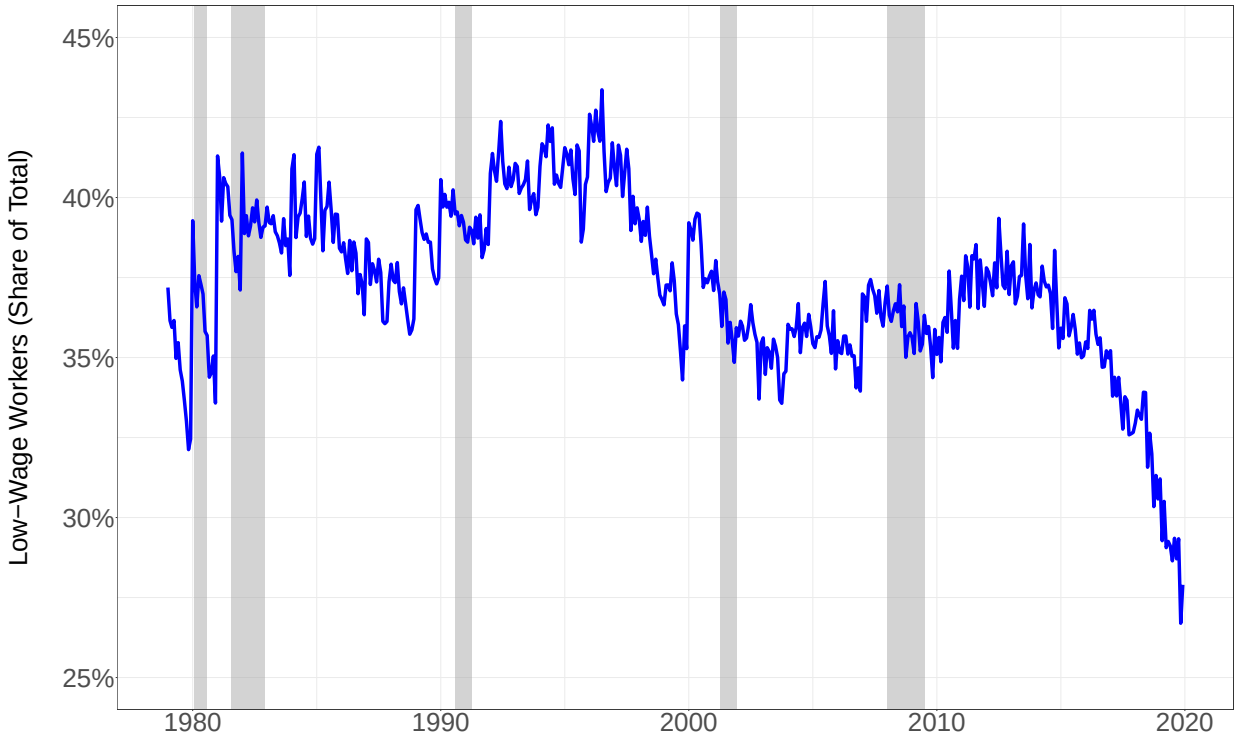


Figure 2: **Declining Share of Low-Wage Workers**
The figure presents the monthly share of US workers (ages 18 to 64) that earn a real hourly wage below $15 (2019 US Dollars). Data on employment and wages are taken from the Current Population Survey (CPS) Outgoing Rotation Group (ORG). Nominal dollars are deflated using the Consumer Price Index for All Urban Consumers (CPIAUCSL). All statistics are calculated using sample weights.

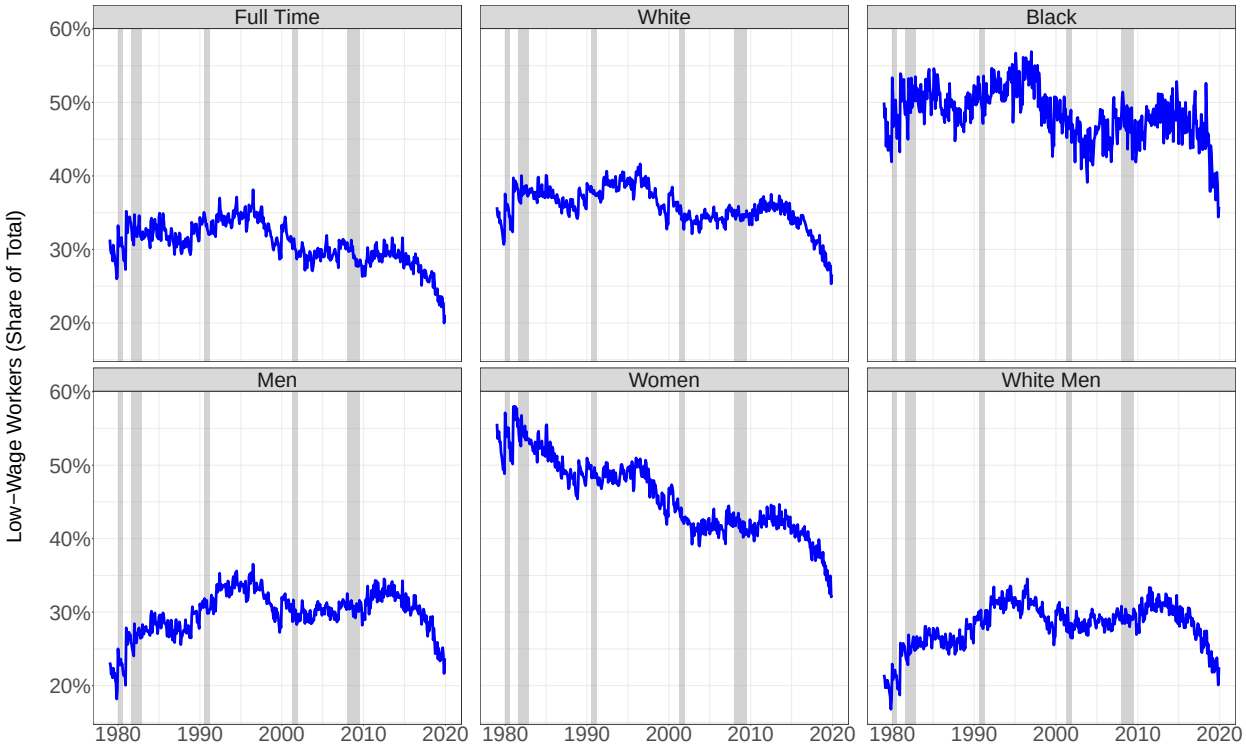


Figure 3: **Share of Low-Wage Workers for Select Sub-Populations**
The figure presents the share of workers (ages 18 to 64) that earn low wages for selected sub-populations of the data. Data on employment and wages are taken from the Current Population Survey (CPS) Outgoing Rotation Group (ORG). In this figure, a worker is classified as a low-wage earner if they earn a real hourly wage below $15 (2019 US Dollars). Full time is defined as working 35+ usual weekly hours. Nominal dollars are deflated using the Consumer Price Index for All Urban Consumers (CPIAUCSL). All statistics are calculated using sample weights.

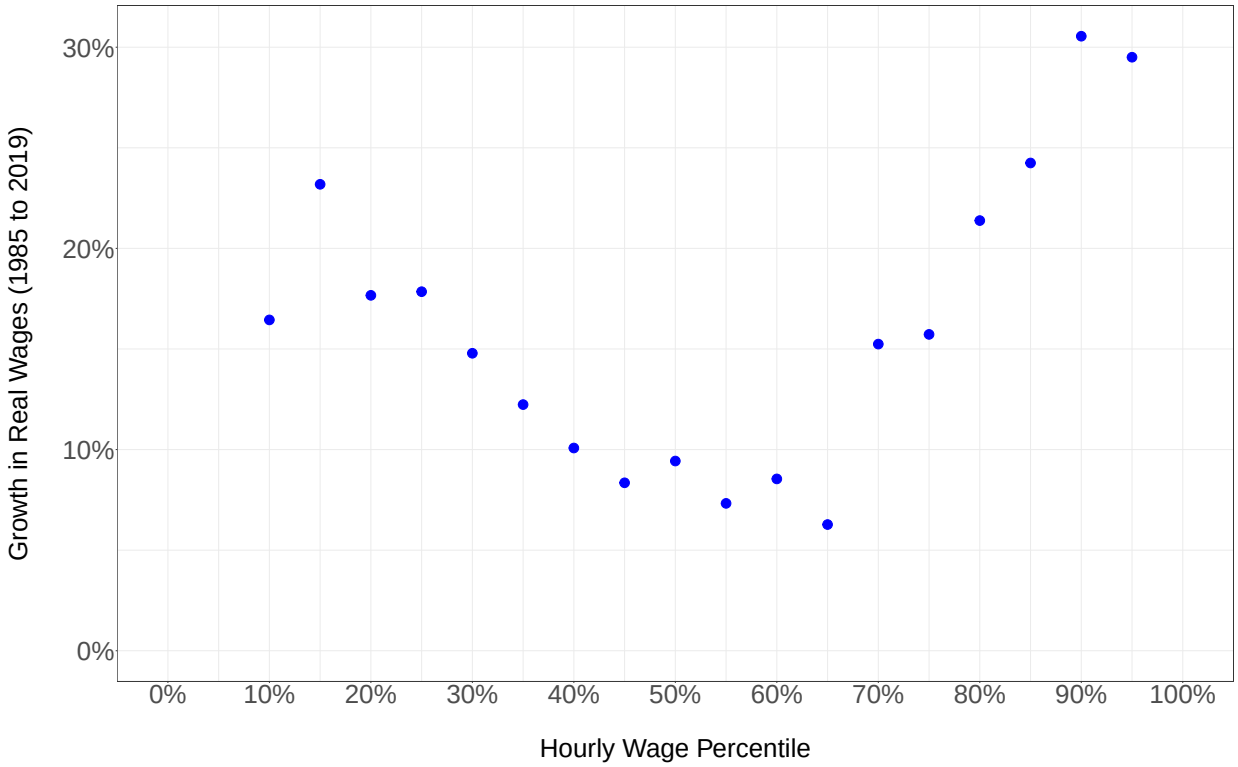


Figure 4: **Growth of Real Hourly Wages by Hourly Wage Percentile**
The figure presents the growth of real hourly wages for US workers (ages 18 to 64) from December 1985 to December 2019 for each hourly wage percentile. Data on employment and wages are taken from the Current Population Survey (CPS) Outgoing Rotation Group (ORG). Nominal dollars are deflated using the Consumer Price Index for All Urban Consumers (CPIAUCSL). All statistics are calculated using sample weights.

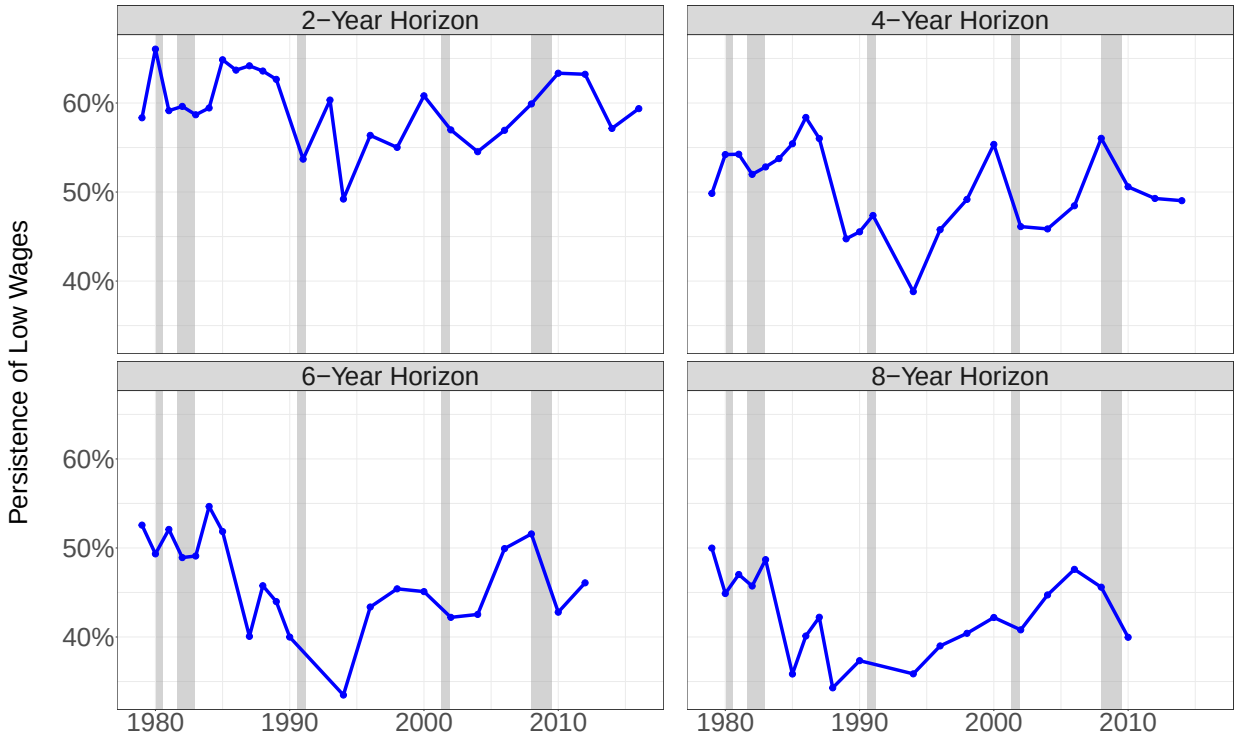


Figure 5: **Persistence of Low Wages**
The figure presents the persistence of low wages for US male workers (ages 18 to 54) from 1979 to 2018. For a given time horizon H, persistence is defined as the share of low-wage workers in year T that continue to earn low wages in $T + H$. The four panels present results using the different time horizons $H \in \{2, 4, 6, 8\}$. Data on employment and wages are taken from the Panel Study of Income Dynamics (PSID). A worker is classified as a low-wage earner if they earn a real hourly wage below \$15 (2019 US Dollars). Nominal dollars are deflated using the Consumer Price Index for All Urban Consumers (CPIAUCSL). All statistics are calculated using sample weights.

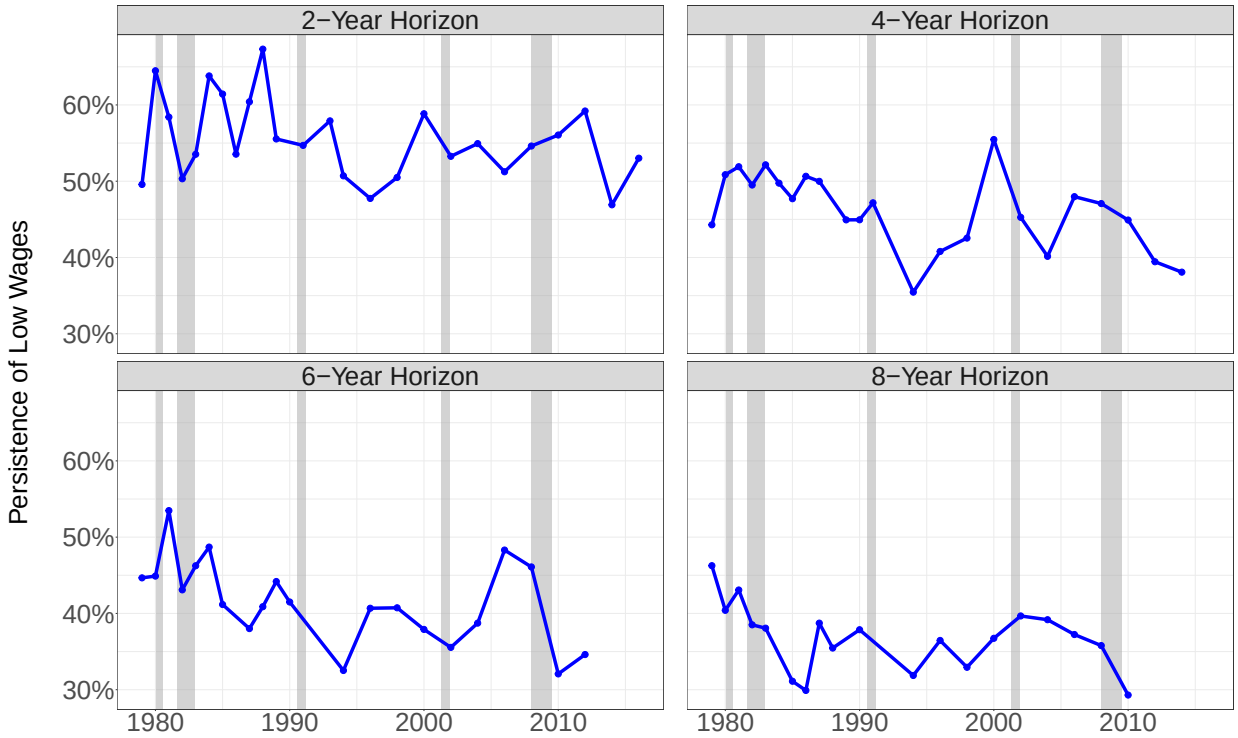


Figure 6: **Persistence of Low Wages for Young Workers**
The figure presents the persistence of low wages for US male workers (ages 25 to 34) from 1979 to 2018. For a given time horizon H, persistence is defined as the share of low-wage workers in year T that continue to earn low wages in $T + H$. The four panels present results using the different time horizons $H \in \{2, 4, 6, 8\}$. Data on employment and wages are taken from the Panel Study of Income Dynamics (PSID). A worker is classified as a low-wage earner if they earn a real hourly wage below \$15 (2019 US Dollars). Nominal dollars are deflated using the Consumer Price Index for All Urban Consumers (CPIAUCSL). All statistics are calculated using sample weights.

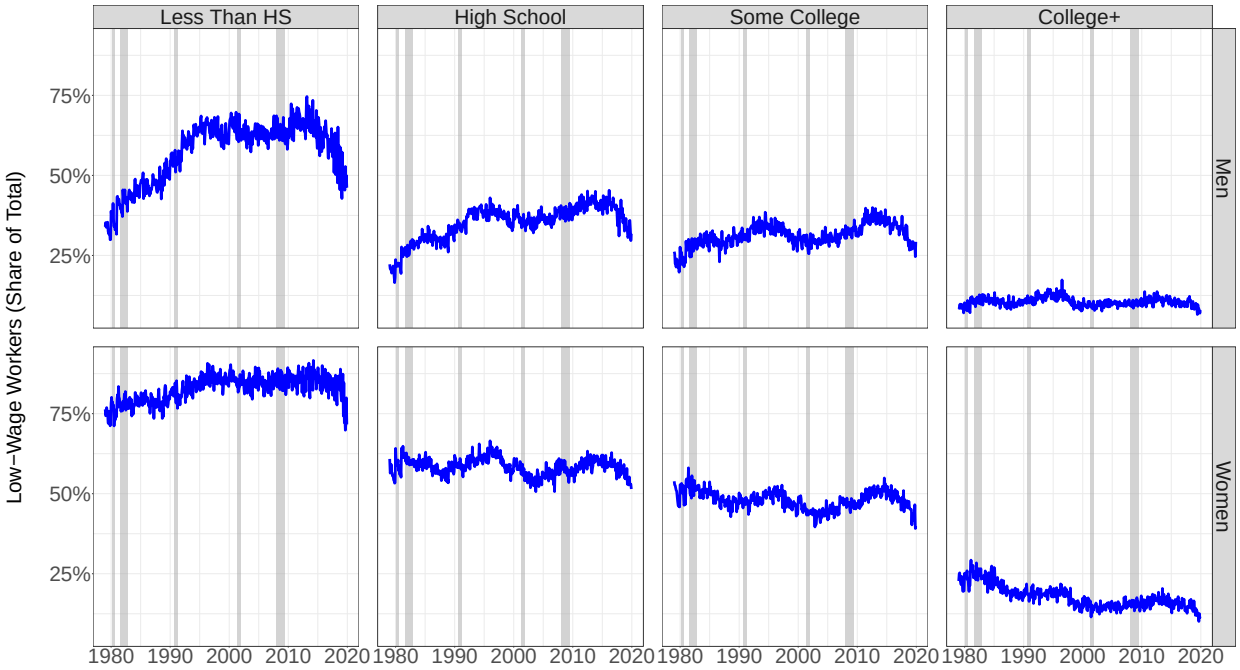


Figure 7: **Share of Low-Wage Workers by Sex and Education**
The figure presents the share of workers (ages 18 to 64) that earn low wages for all interactions of sex (male and female) with education (less than high school, high school, some college, and college+). Data on employment and wages are taken from the Current Population Survey (CPS) Outgoing Rotation Group (ORG). In this figure, a worker is classified as a low-wage earner if they earn a real hourly wage below $15 (2019 US Dollars). College+ is defined as completing a Bachelor's degree or higher. Nominal dollars are deflated using the Consumer Price Index for All Urban Consumers (CPIAUCSL). All statistics are calculated using sample weights.

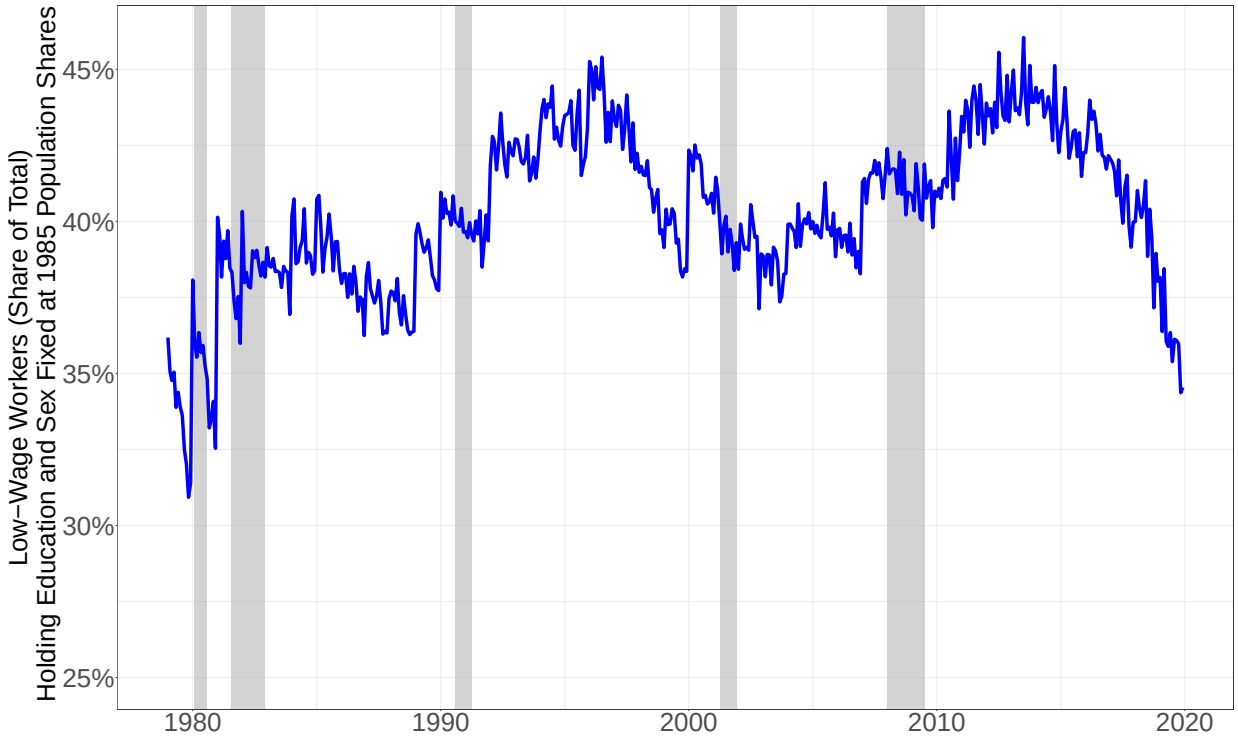
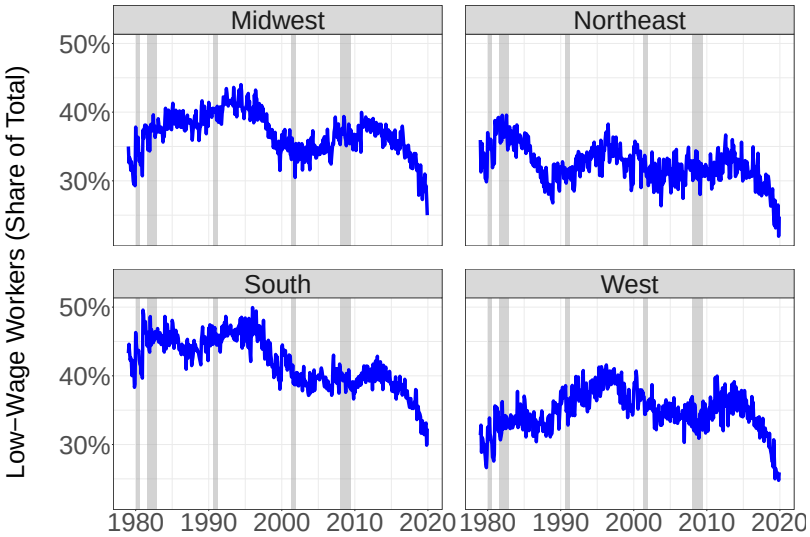
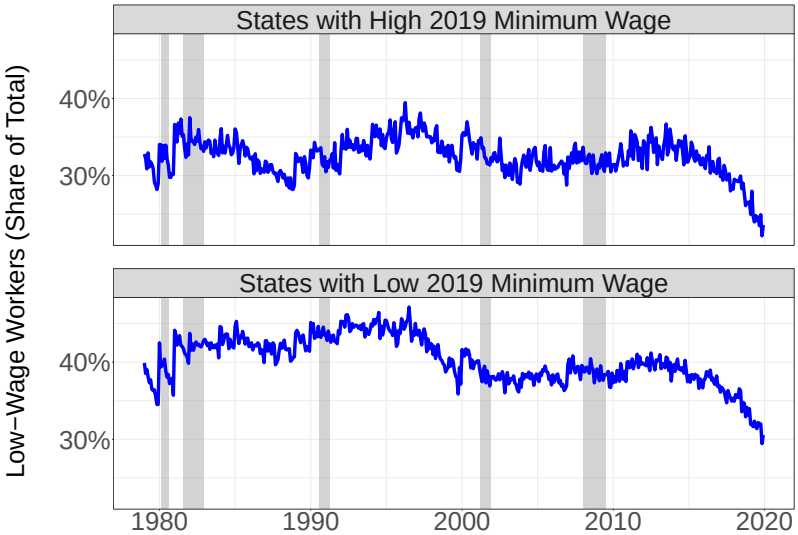


Figure 8: **Share of Low-Wage Workers, Fixed Sex–Education Population Weights**
The figure presents the monthly share of US workers (ages 18 to 64) that earn a real hourly wage below $15 (2019 US Dollars), using fixed 1985 population shares of each of the 8 sex–education bins. Data on employment and wages are taken from the Current Population Survey (CPS) Outgoing Rotation Group (ORG). Nominal dollars are deflated using the Consumer Price Index for All Urban Consumers (CPIAUCSL). All statistics are calculated using sample weights.

Figure 9: **DFL Adjusted Growth of Real Hourly Wages by Hourly Wage Percentile**
The figure presents the growth of real hourly wages for US workers (ages 18 to 64) from December 1985 to December 2019 for each hourly wage percentile, after we implement the DFL re-weighting of the 2019 population to match the 1985 demographics. We implement the DFL procedure using 64 bins that correspond to all interactions of sex (male and female), race (white and non-white), education (less than high school, high school, some college, and college+), and age (18–25, 26–35, 36–50, and 51–64). Data on employment and wages are taken from the Current Population Survey (CPS) Outgoing Rotation Group (ORG). Nominal dollars are deflated using the Consumer Price Index for All Urban Consumers (CPIAUCSL). All statistics are calculated using sample weights.



(a) Split by Census Region



(b) Split by State Minimum Wage

Figure 10: **Share of Low-Wage Workers by Geographic Area**
The figure presents the monthly share of US workers (ages 18 to 64) that earn a real hourly wage below $15 (2019 US Dollars), for different geographic areas. Panel A presents results for each of the four census regions (Northeast, Midwest, South, and West). Panel B presents results for two groups of states: those with a high minimum wage in 2019 ($10 or higher) and those with a low minimum wage (below $10). Data on state and federal minimum wages are taken from the US Department of Labor. Data on employment and wages are taken from the Current Population Survey (CPS) Outgoing Rotation Group (ORG). Nominal dollars are deflated using the Consumer Price Index for All Urban Consumers (CPIAUCSL). All statistics are calculated using sample weights.