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Race and the Manufacturing Workforce: Opportunities to Expand Growth and Equity in a Rebounding Industry Sector

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RACE AND THE MANUFACTURING WORKFORCE: Opportunities to Expand Growth and Equity in a Rebounding Industry Sector

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ABSTRACT

This paper provides an overview of the manufacturing work experience of different racial groups. Our goal is to lend support to “middle-out” policy responses that seek to promote greater economic opportunity across the country through targeted sector growth, including manufacturing, while also bringing together people of all races in support of manufacturing regeneration. By pinpointing persistent inequities in U.S. manufacturing, we hope to embolden policy responses that ensure that as the manufacturing sector rebounds and continues to evolve, its high-paying, good-quality jobs are also more inclusive of workers of color.

JEL Codes: J15, J3, L52, L60

Key Words: manufacturing, workforce, deindustrialization, race, gender

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KEY FINDINGS

- Manufacturing jobs during the 1960s and 1970s were highly desirable for their high wages for all workers, but they provided particular economic advantages for Black workers.
- After this short-lived period of relative advantage, non-college educated Black manufacturing workers suffered the sharpest wage premium decline between 1980 and 2010, during a time when all races of non-college educated workers experienced a wage premium decline in manufacturing.
- A multivariate analysis indicates that even after controlling for factors that contribute substantially to a worker's earnings, including the education of workers, their age, weeks and hours worked above full time, and occupation, there are still large wage gaps present in the manufacturing industry by race/ethnicity and sex.
- We end with a note of hope—wage premiums for Black and Latino manufacturing workers increased nationally from 2010 to 2020 and were especially pronounced for Black manufacturing workers based in the Midwest region of the country. This result suggests an opportunity for the manufacturing sector nationally to learn from and replicate the successes in the Midwest as a focal point for reducing income inequality.

INTRODUCTION AND BACKGROUND

The rise and fall of American manufacturing has been interwoven with the rise and fall of the American middle class. Just as good jobs in automotive plants gave rise to middle-class cities like Flint, Michigan, the decline of the auto industry—first in the late 1970s and early 1980s, and again in the 2000s—was also a contributor to the hollowing out of these very places and proved devastating for the workers who lived there. And the consequences have been more severe for some workers than for others.

William Julius Wilson, the pioneering sociologist, showed that the impacts of manufacturing decline were acutely felt among the Black working class in cities like Chicago. In *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*, Wilson (1987)

proposed what he called “the deindustrialization hypothesis,” which posits that the decline of manufacturing job opportunities in the inner city in the early 1980s contributed to a cluster of problems for Black communities flowing from joblessness. Wilson’s hypothesis was specific to the experience of Black manufacturing workers in cities in the 1980s, but it is suggestive of a broader claim: as manufacturing jobs disappeared, workers of color have suffered disproportionately.

For many communities of color, the decline in manufacturing jobs has added to preexisting and entrenched sources of public neglect and policies of “organized deprivation”: one of these being discriminatory home-lending practices, including New Deal-era actions known as redlining. Redlining used various means to relegate Blacks to certain neighborhoods or deny them home loans, thus depriving Black communities of capital and a means to accumulate generational wealth (Rothstein 2017); white flight shrunk the urban tax base; Black elected officials were undermined by states in their efforts to enact progressive social policy; and the legal system was unresponsive to private discrimination in housing and employment—all of which devastated Black communities (Hackworth 2019; McGahey 2022). In this context, the loss of manufacturing jobs in the late 1970s, associated with trade-policy-fueled globalization, and the suburbanizing, offshoring, and outsourcing of production, combined to deliver yet another blow to Black communities (Fullilove 2016).

Policymakers have recognized how this entrenched divestment in regions and communities suffering most from industrial decline has led to stark geographic inequalities. Federal legislation, reinforced through state-level actions, is helping to fuel a new wave of reinvestment in American manufacturing, offering the potential to also bring new manufacturing jobs to disinvested communities of color. Beyond this push to expand is a related need to address

long-standing sources of racial wage disparity and occupational segregation that persist within legacy manufacturing communities and industries. Black and Hispanic or Latino workers are overrepresented in manufacturing jobs today, but that also means policy actions must ensure that workers of color benefit from the growth of U.S. manufacturing investment through increases in the *quality* of manufacturing jobs. Growing federal and state support for American manufacturing thus presents an opportunity to rebuild a robust middle class that is more inclusive of historically disadvantaged economic groups and geographies by also ushering in new investments into communities of color (Goger and Ozkazanc-Pan 2023).

To help inform this policy effort, this paper provides an overview of the manufacturing work experience of different racial groups, including Latino workers, whose population in the United States has nearly tripled since the publication of *The Truly Disadvantaged*. Our goal with this analysis is to lend support to “middle-out” policy responses that seek to both promote greater economic opportunity across the country through targeted sector growth, including manufacturing, while also bringing together people of all races in support of manufacturing regeneration (Cordova, Wilson, and Stettner 2018). By pinpointing persistent inequities in U.S. manufacturing, we hope to embolden policy responses that ensure that as the manufacturing sector rebounds and continues to evolve, its high-paying, good-quality jobs are also more inclusive of workers of color.

Methods

We draw on a mix of publicly available data sources to identify racial inequities and trace their historic and current impacts. For this analysis, we reviewed literature and census data to gain a better understanding of the manufacturing work experience of different racial groups. We examined manufacturing jobs and wages between 1960 and 2020 in order to identify wage gaps

over time and to identify which racial groups have suffered most from job declines, and in which regions. We then conducted a multivariate analysis to better isolate racial and gender wage disparities in relation to alternative explanatory factors.

Results

Broadly speaking, our analysis reveals four major findings. First, manufacturing jobs during the 1960s and 1970s were highly desirable for their high wages for all workers, but they provided particular economic advantages for Black workers. During this earlier period, Black manufacturing workers had a higher wage premium compared to white manufacturing workers, particularly in the Midwest and the South. In the Midwest, for example, Black manufacturing workers in the 1960s and 1970s made approximately 40 percent more than Black workers in the rest of the labor market.

As we also discovered, this period of relative advantage was short-lived, bringing us to a second finding: non-college educated Black manufacturing workers suffered the sharpest wage premium decline between 1980 and 2010, a period in which all races of non-college educated workers experienced a wage premium decline in manufacturing. The decline in wage premiums for all races of workers represents a convergence to a point where, in 2010 and 2020, wage premiums for noncollege workers were near or below 0 percent. This convergence shows the loss of the comparative wage advantage which manufacturing jobs provided in the decades prior. A convergence in wage premiums among racial/ethnic groups did not mean that wages were even among these groups, so we sought to understand the present wage gap by both race and sex.

A third finding, which results from our multivariate analysis, indicates that even after controlling for factors that contribute substantially to a worker's earnings—including the

education of workers, their age, weeks and hours worked above full-time, and occupation—there are still large wage gaps present in the manufacturing industry by race/ethnicity and sex.

Our final finding offers greater hope, as it illuminates a pathway through which manufacturing work can be a catalyst for promoting greater income equality. We find that wage premiums for Black and Latino manufacturing workers increased nationally from 2010 to 2020. These gains were especially pronounced for Black manufacturing workers based in the Midwest region of the country. This result suggests an opportunity for the manufacturing sector nationally to learn from and replicate successes in the Midwest and act as a focal point for reducing income inequality.

A historical analysis

Examining the manufacturing sector since 1960 reveals three distinct chapters of the labor market that relay an uneven story of jobs and wages.

In the first, between 1960 and 1980, manufacturing jobs grew, but the wages those jobs paid were declining relative to wages in the rest of the economy. Manufacturing jobs still paid more than jobs in services, but the wage premium for manufacturing jobs, which measures the percentage difference between wages in manufacturing compared to all other industries, had begun to decrease.

In the second period, between 1980 and 2010, manufacturing employment plummeted from approximately 19.5 million jobs in 1980 to 11.5 million jobs in the aftermath of the Great Recession in early 2010. The racial composition of the manufacturing workforce also changed (see Figure 1). During this period, the manufacturing wage premium continued to decline. By 2000, workers with a college degree could earn far more in the service sector than they could on

the factory floor. For workers without a college degree, manufacturing jobs paid slightly more, but the gap continued to shrink.

Most recently, in the third period, between 2010 and 2020, the manufacturing industry expanded, adding approximately 1.5 million new jobs, but the wage premium for manufacturing work continued to decrease. There are signs that relative manufacturing wages may begin to increase again as manufacturers vie to attract workers.

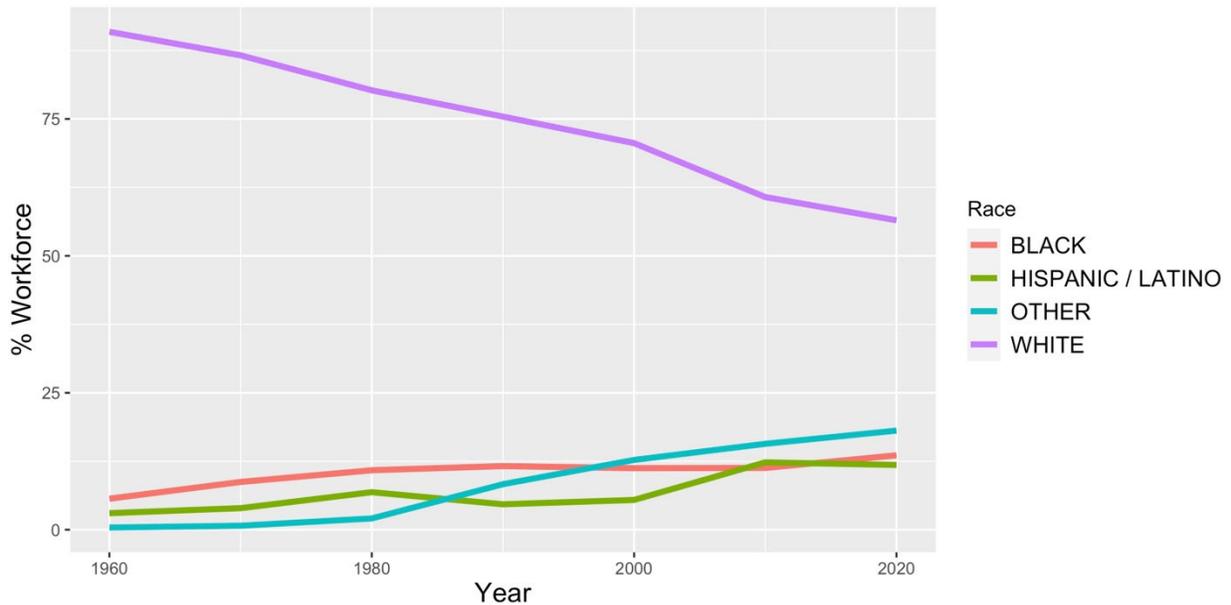
Although these patterns have been recognized in other research, it is unclear how different groups—and different regions—have experienced these three chapters. We conducted data analysis to better ascertain how wages differed by race, gender, and region. The analysis here focuses particularly on the Midwest and, to some extent, the South—both regions where wage and employment patterns by race have differed sharply. The historical data analysis focuses primarily on Black and white Americans because these were the two primary racial groups in the manufacturing labor market in 1960.

Manufacturing workforce and wage premiums

Based on the analysis of census data from 1960 to 2020, three findings stand out. The first is that during the 1960s and 1970s, Black Americans had a higher wage premium for working in manufacturing compared to white Americans, particularly in the Midwest and the South. Black manufacturing workers in the Midwest, for example, made approximately 40 percent more than Black workers in the rest of the labor market (see Figure 2b). By contrast, white workers without a college degree only made approximately 25 percent higher wages in manufacturing compared to white workers in the rest of the economy. Manufacturing wages for white workers and Black workers in the Midwest were largely comparable, whereas wages for white workers without a college degree in the rest of the labor market were higher than those for

Black workers. In short, manufacturing jobs during this period were highly desirable to all workers for their high wages, but provided particular economic advantages for Black workers.

Figure 1 Share of Manufacturing Jobs by Race over Time

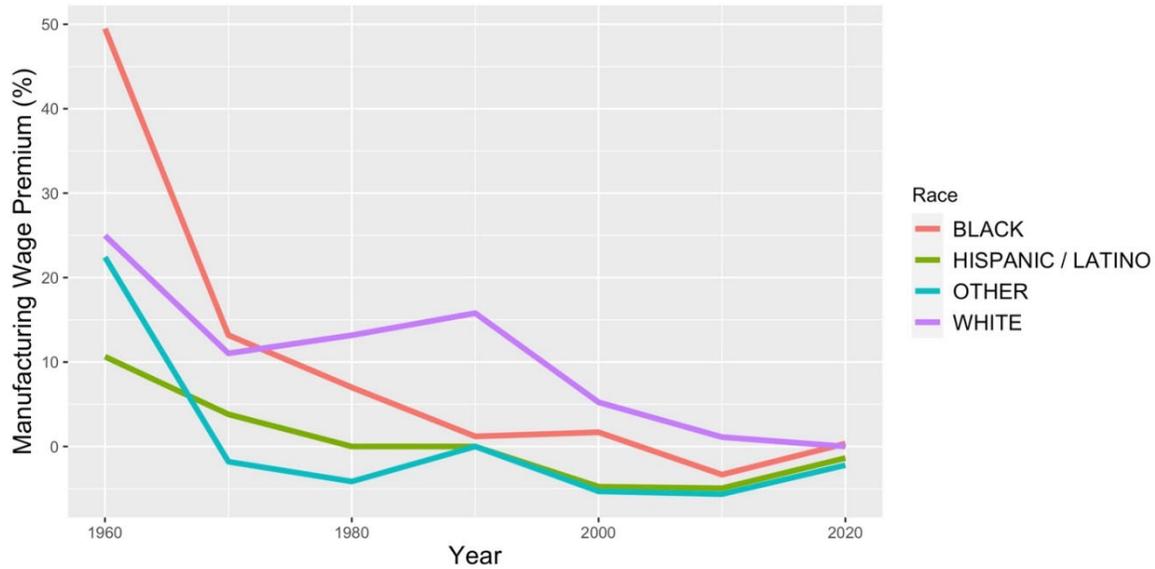


NOTE: Data are from decennial U.S. censuses in 1960, 1970, 1980, 1990, and 2000, and from American Community Surveys in 2010 and 2016–2020 (representing year 2020). The sample consists of workers who are between the ages of 18 and 65, are employed, and reported their income on the census survey. The “Hispanic or Latino” category is “nonwhite Hispanic” in the census data. “Manufacturing workforce” in the figure includes workers classified in production occupations in manufacturing industries.

SOURCE: Authors’ calculations, based on data from Ruggles et al. (2021).

The second insight is that as manufacturing employment and the manufacturing wage premium declined between 1980 and 2010 for all races, Black workers experienced the sharpest declines. Black workers (along with Hispanic or Latino workers) made up a higher proportion of the manufacturing workforce—likely because Black and Hispanic or Latino workers without a college degree in the Midwest, for example, could still earn more in manufacturing jobs than in other employment. In other regions, the manufacturing wage premium for Black manufacturing workers was negative, which helps explain the trends in Figure 2a. For white workers without a college degree, the wage premium in manufacturing neared 0 percent by 2010, making manufacturing jobs far less appealing.

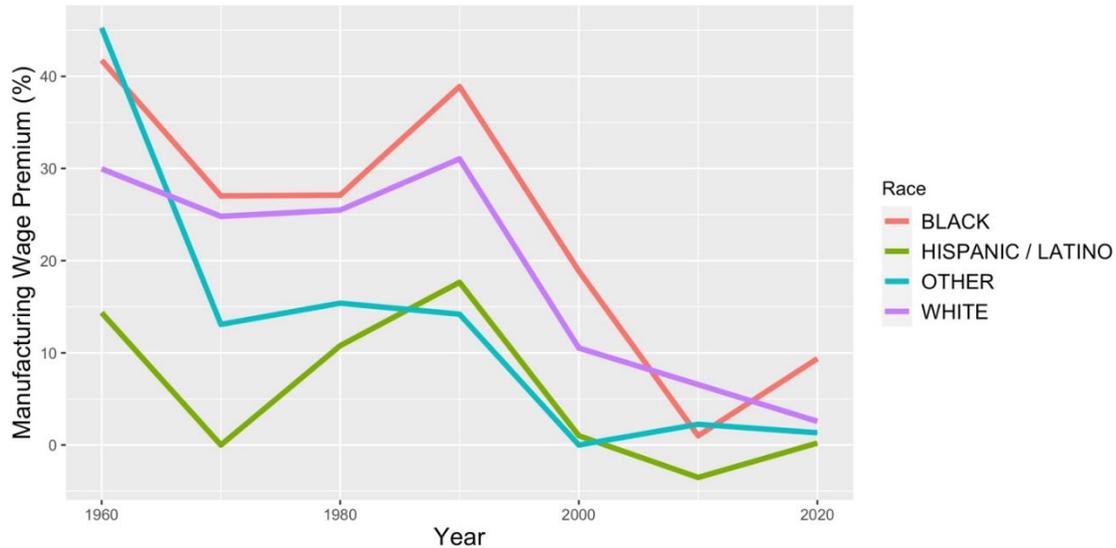
Figure 2a Manufacturing Wage Premium among Noncollege Workers by Race (U.S. total)



NOTE: See note to Figure 1 on sample construction. The manufacturing wage premium is calculated as the percentage difference between the median wages for workers with less than 16 years of education (proxy for a college degree) in manufacturing/production jobs and the median wages for workers with less than 16 years of education in jobs elsewhere in the economy.

SOURCE: Authors' calculations, based on data from Ruggles et al. (2021).

Figure 2b Manufacturing Wage Premium among Noncollege Workers by Race (Midwest)



NOTE: The data are a subset of those in Figure 2a. The U.S. Midwest is defined by the U.S. Census Bureau and includes Ohio, Michigan, Indiana, Illinois, Wisconsin, Missouri, Iowa, Minnesota, Kansas, Nebraska, South Dakota, and North Dakota.

SOURCE: Authors' calculations, based on data from Ruggles et al. (2021).

The third finding is that as manufacturing employment has expanded since 2010, the wage premiums for manufacturing work in the Midwest and the South have appeared to

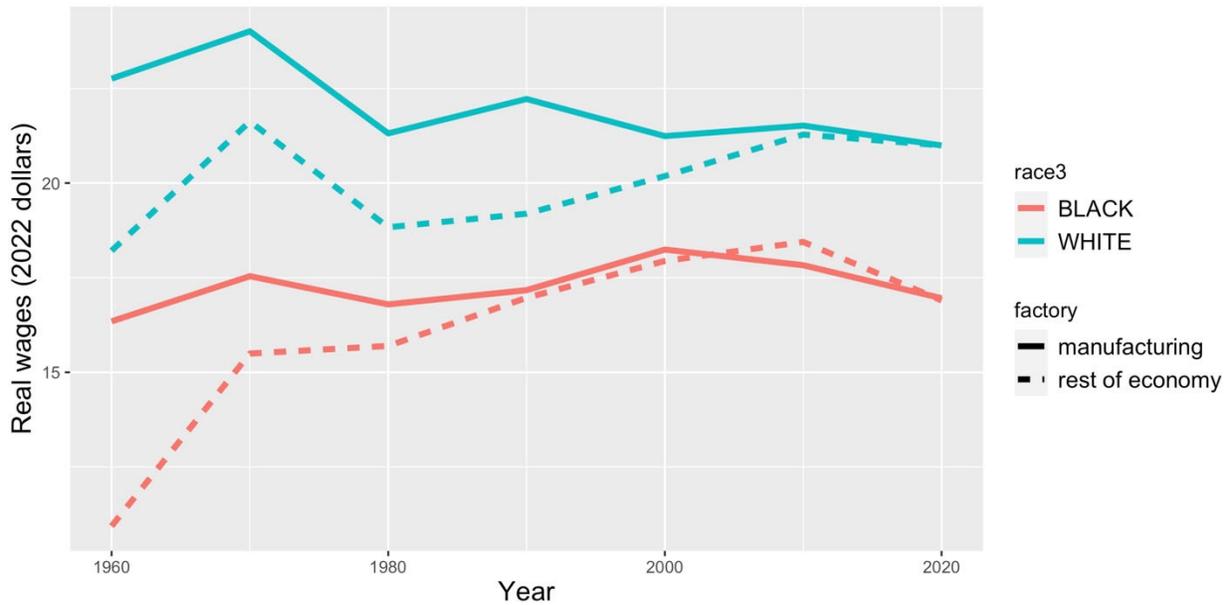
stabilize. This is a positive trend for Black and Hispanic or Latino workers, because they continue to grow as a share of the manufacturing workforce overall. And in the Midwest, the wage premium for Black manufacturing workers jumped between 2010 and 2020. Employment opportunities for Black and Hispanic or Latino workers in manufacturing have expanded, and the wages for those manufacturing jobs continue to be higher than other opportunities for Black and Hispanic or Latino workers without a college degree.

Decomposing the declining manufacturing wage premium

There are several potential explanations for the sharp decline in the manufacturing wage premium, particularly among Black manufacturing workers. The first potential explanation is that real manufacturing wages have flattened in the United States as a result of foreign competition and disinvestment in U.S. manufacturing as part of a global race to the bottom in manufacturing wages. A second, alternative explanation is that the decline in the wage premium is a function of growth in real wages outside manufacturing industries—not necessarily the decline of real manufacturing wages. A third, adjacent explanation is that the declining wage premium at the national level reflects a shift in manufacturing employment from primarily high-wage regions of the United States (cities in the Northeast and Midwest) to lower-wage areas, including parts of the rural South.

Testing these hypotheses requires decomposing the manufacturing wage premium by sector and region. Figure 3 compares manufacturing and nonmanufacturing wages for non-college graduates over time for Black workers and white workers. It shows that the decline in the wage premium before 1980 can be attributed to a sharp rise in wages outside manufacturing sectors. After 1980, the steadily declining wage premium is due primarily to flat real wages in manufacturing. These trends are true for white and Black workers alike.

Figure 3 Comparing Real Wages for Manufacturing and Nonmanufacturing Workers without a College Degree (1960–2020)

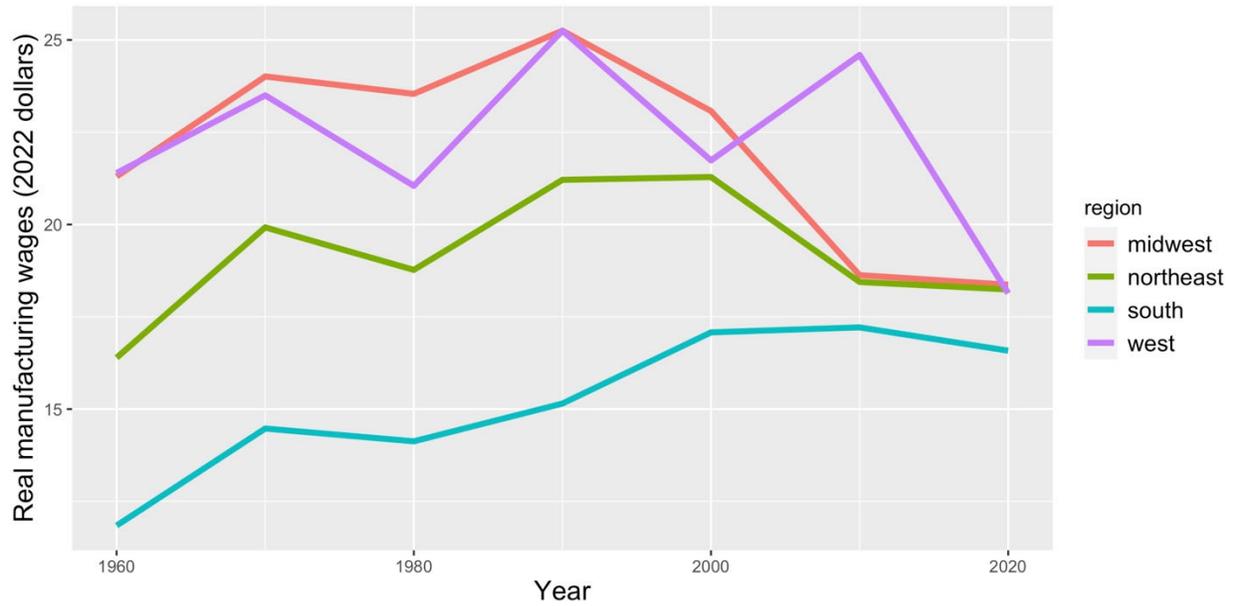


NOTE: See note to Figure 1 on sample construction. Wages are adjusted for inflation to year 2022 dollars. The solid lines show real wages for manufacturing workers while the dashed lines show real wages for other workers. The difference between them is the manufacturing wage premium.

SOURCE: Authors' calculations, based on data from Ruggles et al. (2021).

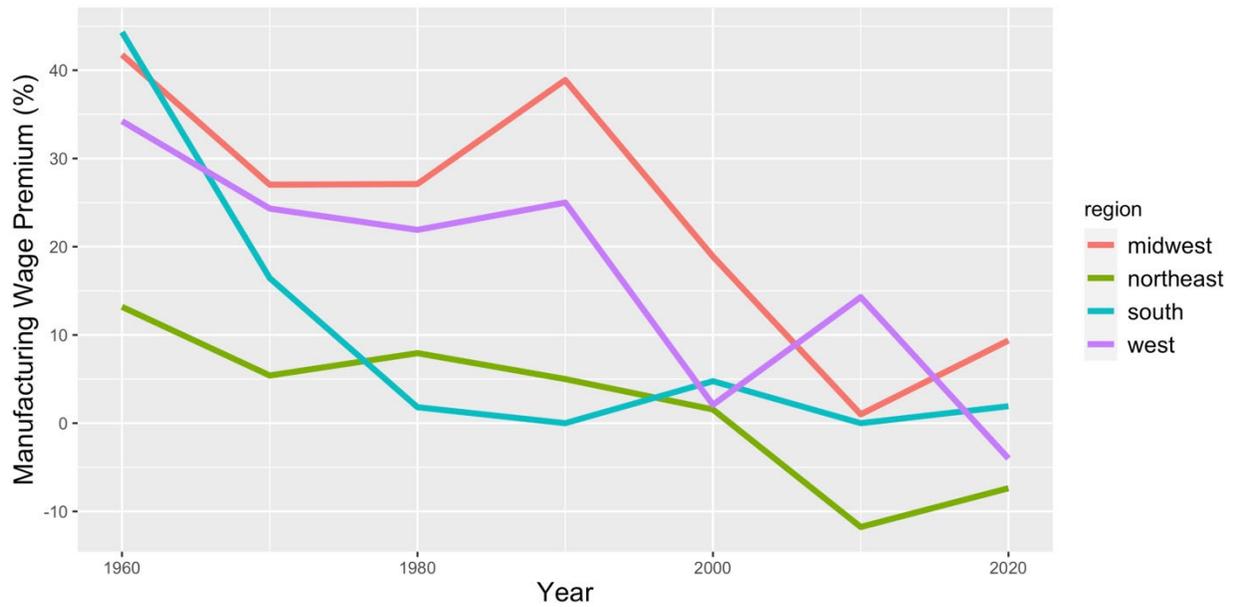
Figures 4a and 4b decompose the manufacturing wage premium data by region, with a focus on trends in real manufacturing wages. It shows that, for Black workers, real manufacturing wages varied sharply by region. In the 1960s and 1970s, real manufacturing wages for Black workers were significantly higher in the Midwest than in the South (the racial wage gap between Black and white manufacturing workers was also significantly smaller in the Midwest). This indicates that the shift of manufacturing employment from Midwest to South during this period certainly put downward pressure on national real wages.

Figure 4a Real Manufacturing Wages for Black Workers by Region (1960–2020)



NOTE: See note to Figure 1 on sample construction.
 SOURCE: Authors' calculations, based on data from Ruggles et al. (2021).

Figure 4b Manufacturing Wage Premium for Black Workers by Region (1960–2020)



NOTE: See note to Figure 1 on sample construction.
 SOURCE: Authors' calculations, based on data from Ruggles et al. (2021).

However, while real manufacturing wages for Black workers in the Midwest were flat or even declining between 1960 and 2000, real manufacturing wages in the South for Black workers without a college degree were steadily increasing until 2000. Moreover, the wage premium *within the South* for manufacturing work declined during the 1960s and 1970s. Thus, the declining manufacturing wage premium was not a case of manufacturing work becoming more attractive in the low-wage South, but rather, a case of it becoming less attractive in the higher-wage Midwest. Real wages were both increasing in the South (faster than in other regions), and the regional wage premium for manufacturing was quickly declining.

Each of the three primary hypotheses can explain part of the declining wage premium. Before 1980, high wage growth for noncollege workers outside of manufacturing made manufacturing jobs less attractive by comparison. Moreover, real manufacturing wages in most regions were flat or declining after 1990. And although manufacturing jobs shifted to the lower-wage South during this period, contributing to the flattening of national real manufacturing wages, the South itself still suffered from a declining manufacturing wage premium for noncollege workers, due to the fast growth of nonmanufacturing wages.

Occupational segregation and wage gaps by race and gender

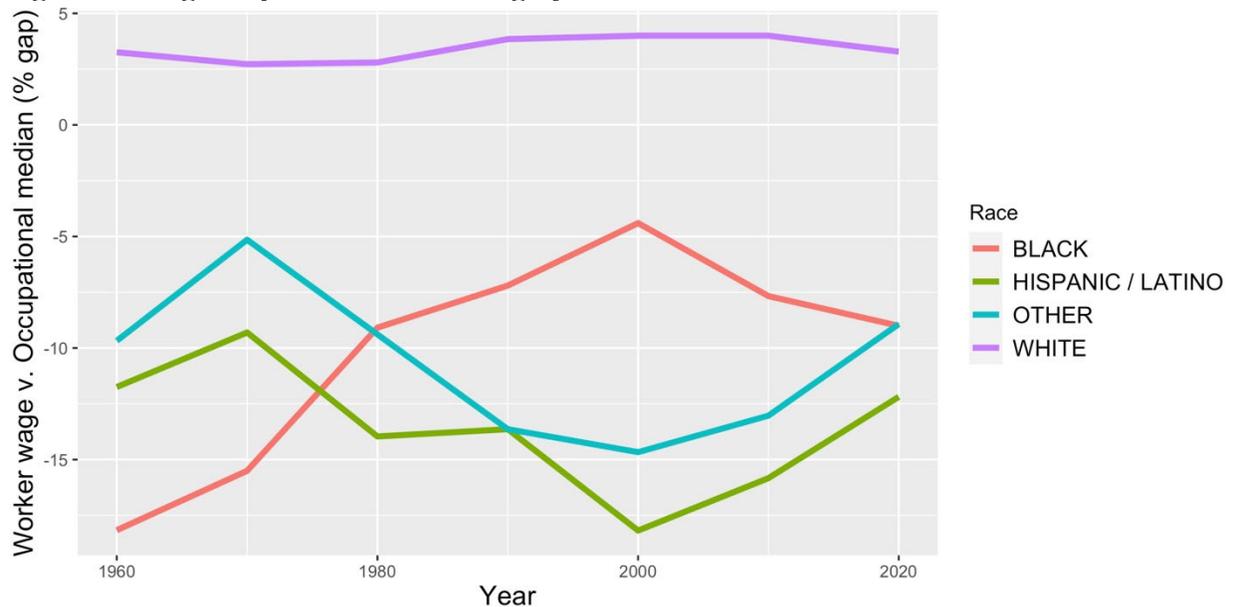
In 2023, racial minorities were represented in greater numbers in the manufacturing workforce than in the workforce as a whole, but there remain gaps in racial representation in the types of manufacturing jobs in which racial minorities are employed—and the wages they earn in those jobs. In the manufacturing workforce, there are three tiers of production-related jobs that are typically available to workers without a college degree. The lower-wage tier includes operator and assembly jobs that typically do not require industry experience or related training. The middle-wage tier includes technician and precision production jobs, which pay a higher

wage and typically require some advanced training or industry experience. These positions might require knowledge of advanced production technology or management responsibilities. The highest wage tier for manufacturing workers without a college degree includes engineering positions. Although these engineering roles are not production jobs, manufacturing workers without a college degree can rise to engineering positions (approximately 25 percent of all manufacturing engineers do not have a college degree), which pay a significantly higher wage than even middle-tier technician and precision production jobs.

Among production workers, there are two primary gaps between white manufacturing workers and racial minorities, which include Black, Hispanic or Latino, and other nonwhite workers. The first gap is that racial minorities typically earn lower wages than white manufacturing workers for the same jobs. For example, compare a Black manufacturing worker's hourly wage to the median hourly wage for the occupation. The median Black manufacturing worker makes approximately 8 percent less than the median wage for the occupation in which that worker is employed. Although this gap has decreased over time among Black manufacturing workers (see Figure 5), the difference in wages is important to explain and to potentially redress.

While Black, Latino, and other manufacturing workers make less when working in the same occupations as their white counterparts, they also make less when they have the same educational attainment (see Figure 6; also Figures A.1a, A.1b). A high school graduate or someone with vocational training can still, on average, make decent earnings in manufacturing, but the racial earnings gap threatens the viability of manufacturing to be an industry offering middle-class, family-sustaining wages for less-educated minority workers.

Figure 5 Wage Gap in Manufacturing by Race

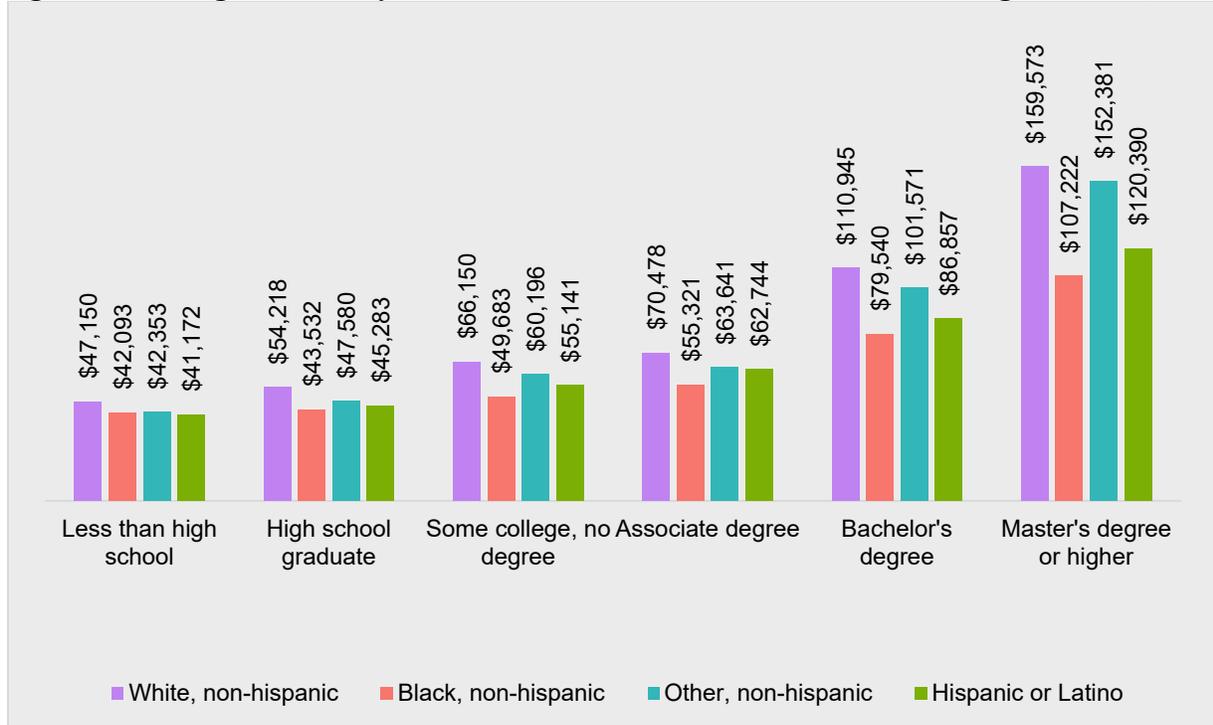


NOTE: See note to Figure 1 on sample construction. This figure represents the median gap between manufacturing workers' wages in a given racial group and the median wage in their occupation across all racial groups. For example, if a worker makes \$40,000 but the median wage for that worker's occupation is \$50,000, the worker makes 20 percent less than the occupational median. The median occupational wage gap for Black manufacturing workers in 2000 was thus approximately -5 percent. SOURCE: Authors' calculations, based on data from Ruggles et al. (2021).

Part of the earnings gaps within the educational categories can be explained by groups being spread unevenly among occupations within the industry. In other words, obtaining higher levels of education does not mean Black and Hispanic or Latino workers are always able to obtain work that utilizes their education and experience. As shown in Deirdre Royster's book *Race and the Invisible Hand: How White Networks Exclude Black Men from Blue-Collar Jobs*, Black vocational-school graduates from the same school who had similar or better performance in that school than their white counterparts fared worse than those white counterparts in the labor market. Specifically, Black graduates were less likely to work directly in the field of their training, spent more time unemployed between jobs, earned lower wages, and had fewer on-the-job training opportunities. Many factors contributed to these different outcomes, but notably, Black students received less assistance from school personnel and teachers compared to white students, and more often had to obtain jobs through formal networks. This left them less

competitive than white job seekers, who could effectively utilize informal referral networks and personal resources to outcompete applicants with only formal network referrals. These differences create an uneven opportunity structure between white and racial minority students, apprentices, and workers.

Figure 6 Average Income by Education for Full-Time U.S. Manufacturing Workers, 2021



SOURCE: Authors' calculations, based on data from Ruggles et al. (2021).

Another notable factor contributing to the manufacturing wage gap is the low rates of workers from racial minority groups moving into middle-tier manufacturing jobs and upper-tier engineering jobs. Among white manufacturing workers without a college degree, 32 percent are employed in middle-wage technician and precision production jobs. Among Black and Hispanic or Latino manufacturing workers with similar educational backgrounds, only 16 percent and 21 percent are employed in these positions, respectively. Among manufacturing engineers without a college degree, 76 percent are white, 6 percent are Black, and 6 percent are Hispanic or Latino.

This is compared to a general production workforce in manufacturing that is 14 percent Black and 12 percent Hispanic or Latino.

To further explore the wage gaps between white, Black, and Latino manufacturing workers, we produced wage gap estimates for full-time employees that controlled for characteristics of workers such as their education level, their occupation within the manufacturing industry, the number of hours per week they work, weeks worked per year, their age as a proxy for experience, the manufacturing subindustry that they work in, and their state of residence.¹

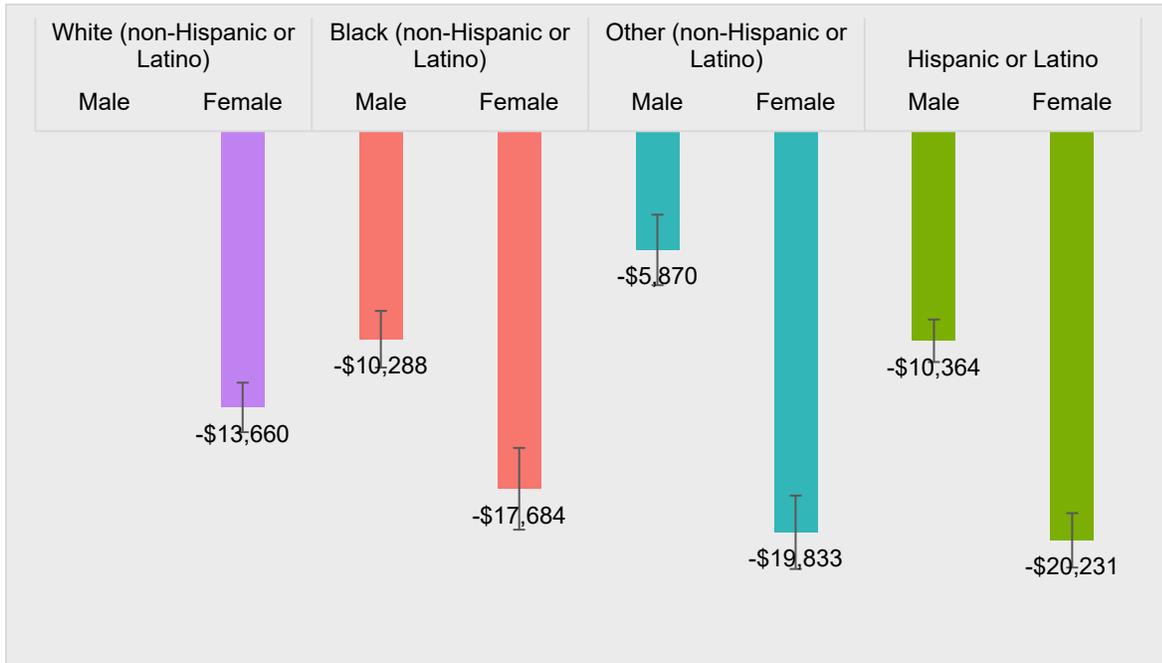
We also separate workers by their sex to investigate an additional dimension of the wage gap. The reference category for the wage gap analysis is white males, so the figures show how each racial and gender group of manufacturers compares to white males in the industry.

The data show that even when controlling for factors that contribute substantially to a worker's earnings, there are still large wage gaps present. For males, Black and Hispanic or Latino males made \$10,288 and \$10,364 less per year than their white male counterparts in the industry. The yearly earnings gaps for females are even more stark. Again, compared to white males in the manufacturing industry, controlling for the factors mentioned previously, white females made \$13,660 less, whereas Black females made \$17,684 less, Hispanic or Latino females made \$20,231 less, and females of other races made \$19,833 less per year (see Figure 7). These data show that sex forms an important intersection with race in understanding the mechanisms that are creating wage gaps in manufacturing. Although females are employed less

¹ Specifically, we estimate yearly earnings by race/ethnicity and sex in an ordinary least squares (OLS) multiple regression framework for workers that worked more than 50 weeks in 2021 and more than 35 hours in a usual week. The independent variables included the highest level of educational attainment, age, weeks worked above 50, usual hours per week above 35, detailed occupation using IPUMS ACS/PRCS 2018–present four-digit occupation codes, detailed industry using IPUMS ACS/PRCS 2018–present four-digit industry codes, and state of residence.

frequently in manufacturing, a possible explanation contributing to the employment gap could be the substantial wage gap.

Figure 7 Wage Gap among Manufacturing Workers between White Males and Other Racial/Sex Groups, 2021



NOTE: See note to Figure 1 for sample construction. Figure shows annual earnings differences for sex and racial groups, relative to white males, among workers in manufacturing, controlling for education, industry, occupation, hours worked, weeks worked, and age of workers. Whiskers show 95 percent confidence intervals.
 SOURCE: Authors' calculations, based on data from Ruggles et al. (2021).

POLICY AND RESEARCH IMPLICATIONS

This research has examined manufacturing wages back to 1960. It shows that the manufacturing sector's historic wage premiums of the 1960s and 1970s have declined over time, and that this decline has disproportionately impacted Black and Latino workers. However, more recently, wage premium increases for Black and Latino manufacturing workers from 2010 to 2020, coupled with slight increases in the shares of the Black and Latino workforce in manufacturing, signal an emerging opportunity for the sector to be a catalyst for addressing income inequality. The need for greater pay equity in manufacturing is clear—large wage gaps

by race/ethnicity and sex are present, even when controlling for factors that contribute substantially to a worker's earnings, such as that worker's education, age, hours, and occupation.

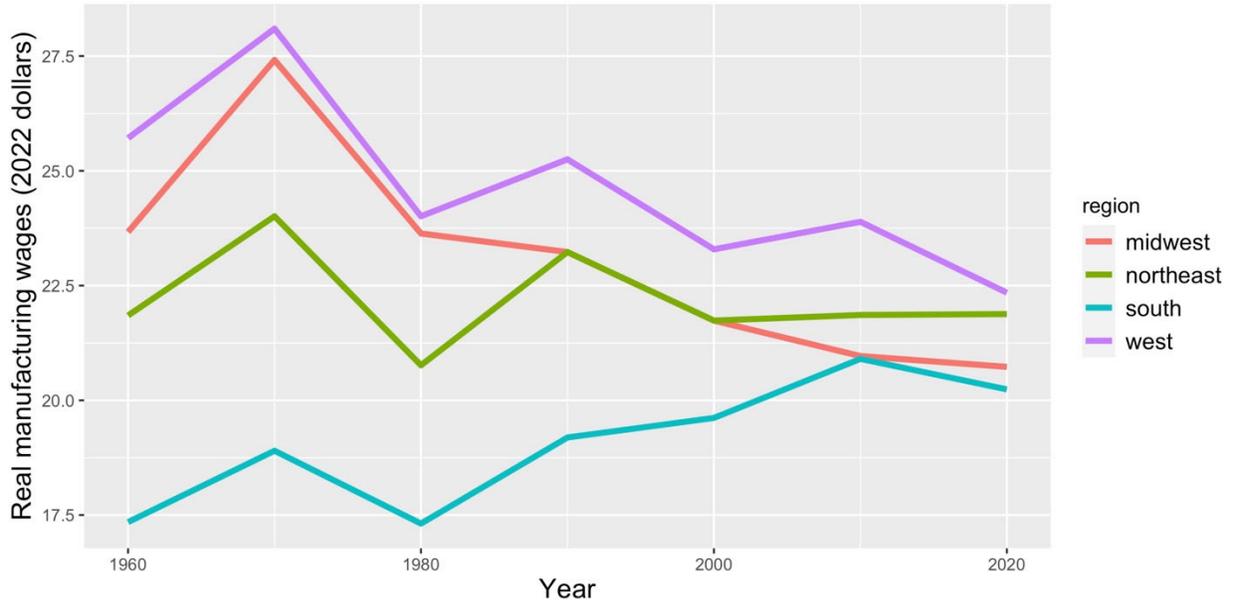
For policymakers focused on supporting a diverse and inclusive manufacturing workforce, our analysis suggests that workers from racial minority groups represent a higher percentage of the manufacturing workforce than they do in the workforce as a whole, but that the wage premium they receive is not as high as it once was. The implication is that as the manufacturing workforce grows, investments in supporting higher-wage manufacturing careers will redound to the benefit of all manufacturing workers, and particularly those groups currently most represented in American factories.

While this research has focused on historic wages, wage premiums, and manufacturing wage gaps by race/ethnicity, future research that contributes to our understanding of inequalities within the manufacturing sector could emphasize how targeted investments can advance economic inclusion within firms, and what types of supports from manufacturing-serving institutions can also achieve that end.

As some manufacturing-supporting institutions have emphasized enhancing job quality through workplace development to address wage and occupational inequalities, including those within the Manufacturing Extension Partnership network (Lowe et. al 2023), documenting more of those strategies and their effectiveness can provide valuable lessons for firms and other manufacturing-supporting institutions.

APPENDIX

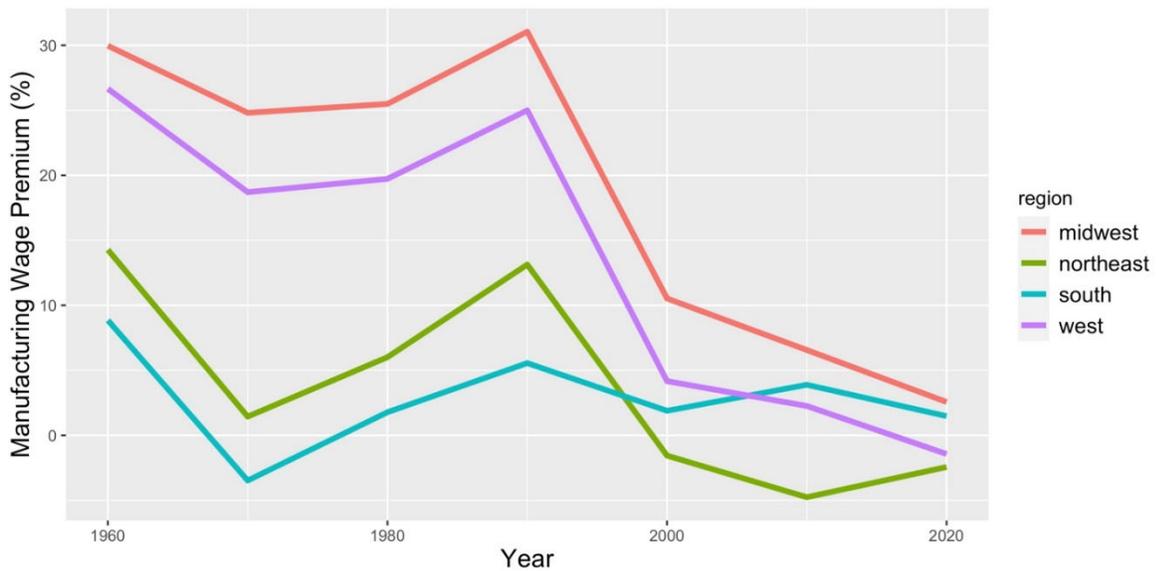
Appendix Figure A.1a Real Manufacturing Wages for White Workers by Region (1960–2020) (companion to Figure 6)



SOURCE: Authors' calculations, based on data from Ruggles et al. (2021).

Appendix Figure A.1b Manufacturing Wage Premium for White Workers by Region (1960–2020) (companion to Figure 6)

SOURCE



SOURCE: Authors' calculations, based on data from Ruggles et al. (2021).

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