



Manufacturing and the Economic Position of Men without a College Degree

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Over the years, education has played an increasingly important role in determining yearly earnings. In 1960 and 1980, working men with a bachelor’s degree earned about 50 percent more than working men without such a degree. This advantage rose to 81 percent in 2000 and to 119 percent in 2015, largely because men without a bachelor’s degree made only modest income gains.

One proposed explanation for this phenomenon is the decline of manufacturing employment, which fell as a share of total employment from 32 percent in 1960 to 11 percent in 2015 (Rose 2018a). Many commentators argue that blue-collar employment in manufacturing provided high-paying jobs for male workers without a bachelor’s degree and that the growth in service jobs provides fewer opportunities for these men. Cherlin (2014) argues that the decline in manufacturing employment contributed to the steep decline of working-class marriage rates because of the paucity of “highly marriageable men.” Looking forward, former *New York Times* economic reporter Louis Uchitelle (2017) says that “manufacturing is the foundation of the nation’s power,” proposing that we increase manufacturing employment 50 percent.

This brief, the third in a series on manufacturing’s role in the US economy, explores the relationship between the declining share of manufacturing employment and the earnings of men without a four-year college degree. I focus on men without a bachelor’s degree because they have been most negatively impacted by the “deindustrialization” of the past 50 years and because they are cited as a reason for Trump’s surprise 2016 victory (Greenberg et al. 2017).¹ To disentangle this relationship, I define five industrial groups and then show the distribution of men without a four-year college degree across these groups from 1960 to 2015. Much like what happened in the economy overall, the share of men without a four-year college degree in the manufacturing industry declined dramatically over these years. Next, I identify five occupational clusters and examine their employment trends. I also track the earnings of

men without a four-year college degree in each occupational cluster. Lastly, I develop a methodology that identifies the minimum earnings in each year a job must pay to qualify as a “good job,” and I show how the prospects of having a “good job” among men without a bachelor’s degree have changed over time by industry and occupation.

For this study, I use large, nationally representative datasets: the long-form censuses of 1960, 1980, and 2000 and the 2015 American Community Survey. These datasets are available in a harmonized form (similar coding of each variable) from the Minnesota Population Center of the University of Minnesota. Earnings are converted into 2015 dollars using the Bureau of Economic Analysis’s personal consumption expenditures deflator.

Industrial Employment

To examine changes in industrial employment and the decline in manufacturing, I group industries into five clusters:

- **agriculture:** farm workers and owners
- **nonmanufacturing production industries:** construction, mining, transportation, utilities, wholesale, and warehousing²
- **manufacturing**
- **low-end services:** retail and personal and food services
- **high-end services:** business (law, finance, and consulting), government, health care, and education

In 1960, manufacturing industries provided the most jobs (nearly 37 percent) for men without a bachelor’s degree; by 2015, that share declined to just over 15 percent, making manufacturing the fourth-largest employer, out of the five major industry groups, of these men (table 1). Employment growth in nonmanufacturing production industries, low-end services, and high-end services offset the 21 percentage-point manufacturing decline and the nearly 2 percentage-point decline in agriculture.

TABLE 1

Share of All Men without a Bachelor's Degree, 1960–2015 (%)*By industry*

	1960	1980	2000	2015
Agriculture	4.7	4.1	3.1	3.0
Nonmanufacturing production industries	25.3	27.4	29.6	28.7
Manufacturing	36.8	29.2	21.4	16.4
Low-end services	17.5	21.4	27.5	31.8
High-end services	15.6	17.9	18.3	20.2

Sources: Author's computations from 1960, 1980, and 2000 censuses and 2015 American Community Survey.

For the overall economy, high-end service industries absorbed most of the loss of manufacturing jobs, but not for men without a four-year college degree. In 1960, high-end service industries employed over 24 percent of all workers and only about 16 percent of men without a bachelor's degree (Rose 2018a). This gap widened over time: Nationally, employment in high-end service industries grew by 19 percentage points, reaching over 43 percent of all workers in 2015. Meanwhile, high-end service employment for men without a bachelor's degree grew by less than 5 percentage points, reaching 20 percent of their employment in 2015.

In contrast, the share of men without a bachelor's degree working in low-end service industries nearly doubled from 17 to 32 percent between 1960 and 2015 (while the national change was from 21 to 31 percent; data not shown). Because these jobs tend to have low earnings, most who made this shift from manufacturing were worse off.

Finally, the employment share for these men in the nonmanufacturing production industries grew by nearly 4 percentage points (from 25 percent in 1960 to 29 percent in 2015). Manufacturing workers without a bachelor's degree who transitioned to nonmanufacturing production industries typically maintained their earnings, thus making a lateral move. Consequently, the slightly increased share of men without a bachelor's degree in nonmanufacturing production industries shows these industries are now the largest source of well-paying jobs for these men. This often goes unnoticed because this cluster contains many disparate industries. But, by putting them together, it becomes clear that they are an important employer of men without a bachelor's degree.

Occupations

The labor market performance of men without a bachelor's degree can also be tracked by examining their changing occupational opportunities. Government agencies, aided by socioeconomic researchers, divide occupations into levels of specificity—some reports have about 500 different occupations, and a few have up to 10,000. In previous work, I combined these detailed occupations into 21 categories to make it easier for the nonexpert to see trends (Rose 2010). This paper combines the 21 categories into five occupational categories:

- **managerial and professional:** workers with the highest levels of authority and skill. They often have a bachelor’s degree and work in the top jobs in business, government, education, and health care (managers in retail and fast food outlets are excluded).
- **middle-skill, nonmanual workers:** a diverse group of workers with medium authority (supervisors and nonprofessional, self-employed workers) and skill (technicians). This group also includes clerical workers, police, and firefighters.
- **blue-collar workers:** workers who do manual labor with machines, vehicles, and moving materials. Typical occupations are supervisors of blue-collar workers, craft and repair workers, factory operatives, truck drivers, miners, longshoremen, and laborers.
- **service and retail workers:** mostly workers with low skills and pay.
- **agricultural workers:** farm owners and laborers.

Although the share of men without a four-year degree in managerial and professional jobs remained almost constant from 1960 to 2015, the 2 percentage-point decline in agricultural workers and the 14 percentage-point decline in blue-collar jobs were offset by a 10 percentage-point increase in middle-skill, nonmanual jobs and a 6.5 percentage-point increase in service and retail workers (table 2).

TABLE 2
Occupations of Men without a Four-Year Degree, 1960–2015 (%)

	1960	1980	2000	2015
Managerial and professional	14.0	12.6	13.3	13.3
Middle-skill, nonmanual	13.4	20.5	23.5	23.4
Blue-collar	56.7	51.2	46.6	42.9
Service and retail	12.0	12.3	14.8	18.5
Agricultural	3.8	3.5	1.9	1.8

Source: Author’s computations from the 1960, 1980, and 2000 censuses and 2015 American Community Survey.

These movements differ significantly from the occupational distribution of all workers. Most significantly, although the share of men without a bachelor’s degree working as managers and professionals fell from 14 to 13 percent from 1960 to 2015, the share of all workers employed in those occupations rose from 17 to 32 percent. So, what started out as a small difference in managerial and professional employment shares (17 percent of all workers versus 14 percent of men without a bachelor’s degree) grew to a significant difference (32 versus 13 percent, respectively).

By contrast, blue-collar jobs were much more prevalent than managerial and professional jobs among men without a four-year college degree. In the overall labor force, the blue-collar share of employment declined from 42 percent in 1960 to 20 percent in 2015. The comparable decline for men without a bachelor’s degree was just 14 points (from 57 to 43 percent).

At 43 percent, blue-collar occupations are still the biggest source of employment for men without a four-year college degree. But the industries in which those blue-collar jobs are found have changed

dramatically. In 1960, 48 percent of men without a bachelor’s degree who were in blue-collar jobs were employed in manufacturing industries, followed by 32 percent in nonmanufacturing production industries and 13 percent in low-end services (table 3). By 2015, the share of blue-collar men without a bachelor’s degree working in manufacturing occupations fell to 26 percent. The industry employing the greatest share of blue-collar workers without a bachelor’s degree is now nonmanufacturing production industries, with a 45 percent share. Finally, 21 percent of these blue-collar men were employed in low-end services, almost as many as employed in manufacturing industries.

TABLE 3

Industries of Blue-Collar Men without a Bachelor’s Degree, 1960–2015 (%)

	1960	1980	2000	2015
Agriculture	0.9	0.7	0.7	0.9
Nonmanufacturing production industries	32.2	36.4	41.2	44.7
Manufacturing	47.6	42.1	32.3	25.9
Low-end services	13.1	13.9	18.3	21.0
High-end services	6.2	6.9	7.5	7.6

Source: Author’s computations from the 1960, 1980, and 2000 censuses and 2015 American Community Survey.

The rising share of middle-skill, nonmanual jobs for men without a bachelor’s degree might look like catch-up as, economy wide, the share of workers in middle-skill, nonmanual jobs grew from 20 to 27 percent between 1960 and 2015, while the share of men without a bachelor’s degree in these occupations rose from 13 to 23 percent. This 10 percentage-point increase offsets most of the 14 percentage-point loss of blue-collar jobs. This is a lateral move, because the increase in middle-skill, nonmanual jobs for men without a bachelor’s degree represents an increase in “managers” in retail and food services companies at comparable pay to blue-collar workers in 2015.

Finally, many more men without a bachelor’s degree have been employed in service and retail jobs (rising from 12.0 percent in 1960 to 18.5 percent in 2015), which pay less than blue-collar jobs in manufacturing industries. This transition has led many commentators to lament the decline in manufacturing employment. But they overstate the consequences of the 22 percentage-point decline in manufacturing for men without a bachelor’s degree; the negative consequence of declining manufacturing employment is mainly concentrated in the 6.5 percentage-point increase in service and retail jobs. The rest of the decline of manufacturing employment was offset by lateral pay moves to blue-collar jobs in nonmanufacturing production industries and to middle-skill, nonmanual jobs.

Earnings Trends for Men without a Bachelor’s Degree

In 1960, 6 percent of men had a bachelor’s degree and 4 percent had a graduate degree. At the time, many of those with a graduate degree worked in intellectual and caring professions (such as education, clergy, and the arts), which paid relatively little for those with the most education. Consequently, the median earnings of men with just a four-year degree were higher than earnings for men with a graduate degree. Another consequence is that men with and without a bachelor’s degree had similar earnings in

managerial and professional jobs—\$44,000 for those with a bachelor’s degree and \$42,000 for those without a bachelor’s degree (adjusting for inflation). By 2015, the earnings of college-educated men in managerial and professional jobs had skyrocketed to \$80,000, 60 percent more than the earnings of men without a bachelor’s degree in these jobs. Nonetheless, earnings for managers and professionals without a bachelor’s degree were much higher than earnings in other occupational clusters.

TABLE 4

Earnings by Occupation for Men without a Bachelor’s Degree, 1960–2015

Constant 2015 dollars

	1960	1980	2000	2015
Managerial and professional	42,196	46,282	52,684	50,000
Middle-skill, nonmanual	32,044	35,823	38,855	34,000
Blue-collar	28,871	34,876	36,879	34,000
Retail sales and services	23,160	22,425	23,313	20,000
Agricultural	8,566	23,766	24,773	25,000
All	28,871	34,876	36,352	32,000

Source: Author’s computations from 1960, 1980, and 2000 censuses and 2015 American Community Survey.

Notes: All earnings were converted to 2015 dollars using the Bureau of Economic Analysis’s personal consumption expenditures deflator.

For middle-skill, nonmanual workers, those with a bachelor’s degree made \$60,000 in 2015, which was 76 percent more than the \$34,000 earned by those without a bachelor’s degree. Among blue-collar workers, having a bachelor’s degree didn’t make much of a difference (just a 17 percent premium), while a bachelor’s degree made an enormous difference among retail sales and service workers; because of the variation of jobs within this occupation group (e.g., sales workers in luxury stores earn high commissions, while those who work in convenience stores earn much less), workers with a bachelor’s degree earned twice as much as those without such a degree.

In all occupations, median earnings for men without a bachelor’s degree in 2015 were lower than in 2000 (table 4). Further, the median earnings of blue-collar workers and middle-skill, nonmanual workers are identical in 2015. In all the preceding years, the earnings of men without a bachelor’s degree in middle-skill, nonmanual jobs were higher than the earnings of those in blue-collar jobs.

Good Jobs

Popular belief holds that blue-collar workers in the 1950s and 1960s lived by “middle-class” standards and that the earnings of a man working at a big plant could support a family of four, including a wife who cared for the kids without entering the workforce. Since this arrangement isn’t as common today, many believe that blue-collar workers have lost ground. Despite the discussion about the decline in well-paying manufacturing jobs, very little empirical work has addressed this issue because it is difficult to define a well-paying job in any year, let alone multiple years.

A common way to compare people's living standards over time is to compare inflation-adjusted earnings. Simply comparing the real earnings of blue-collar workers in 1960 with their earnings today shows that today's blue-collar workers are better off, but that is not surprising considering that real gross domestic product per person in 1960 was one-third of what it is today. In 1960, middle-class households owned small houses (often less than 1000 square feet) without air conditioning or other appliances that we take for granted today. Medicine's ability to treat diseases was much lower, so the average expected life span in the US was nine years shorter than it is today. Cars were heavy gas guzzlers with fewer amenities, such as power brakes, air conditioning, and air bags.

Rather than eroding in real terms, the economic position of men without a bachelor's degree in blue-collar jobs eroded relative to the position of other workers in the economy. Plainly, the norms of today's middle-class life (e.g., a 2000 square-foot house with air conditioning and multiple bathrooms, bigger and more appliances, TVs, computers, cell phones, and other amenities not available in the past) require more money.

So, the key issue is identifying the minimum threshold earnings of a "good job" from 1960 to 2015. Because this is not a simple inflation-adjusted number, I use the 40th earnings percentile of male workers who worked full time for the entire year.³ This number is not affected by the gains of high-earning managers and professionals and shows that the share of male blue-collar workers without a bachelor's degree in good jobs declined from 53 percent in 1960 to 28 percent in 2015.

The share of male workers without a bachelor's degree in good blue-collar jobs decreased in every industry cluster except agriculture, which started with very few good jobs (table 5). Manufacturing workers had the steepest decline, going from 56 percent in 1960 to 42 percent in 2015. In contrast, the nonmanufacturing production industries, which now employ many more male workers without a bachelor's degree than manufacturing industries do, saw the share of those workers in good blue-collar jobs fall from 51 percent to 41 percent. Finally, good blue-collar jobs in low-end services, the other big employer for male workers without a bachelor's degree, declined from 31 percent in 1960 to an anemic 19 percent in 2015.

TABLE 5

Share of Good Jobs by Industry Cluster 1960–2015 (%)*Male workers without a bachelor's degree in blue-collar jobs*

	1960	1980	2000	2015
Agriculture	8.7	23.7	22.1	25.8
Nonmanufacturing production industries	51.2	48.2	44.1	41.2
Manufacturing	55.9	50.2	47.0	42.0
Low-end services	30.8	27.2	25.6	18.8
High-end services	51.2	44.2	46.3	42.5
All	47.4	42.6	39.3	34.0

Source: Author's computations from 1960, 1980, and 2000 censuses and the 2015 American Community Survey.

The share of good jobs within the manufacturing industries group varies considerably. In 1960, some specific industries within manufacturing had very high shares of good jobs: 71 percent of men without a bachelor's degree working as aircraft producers and boat or railroad builders had good jobs. Other manufacturing industries with high shares of good jobs include automobile and parts production (67 percent), chemicals (66 percent), and electrical equipment and machinery (62 percent). In contrast, many other industries (textiles, apparel, wood products, and furniture) had low good-job shares (between 26 and 28 percent).

By 2015, only aircraft producers and boat or railroad builders and primary metals had over half of their workers in good jobs. Many unionized manufacturing occupations had over 60 percent of their male workers without a bachelor's degree in good jobs in 1960 but experienced steep declines in good-job shares by 2015. These include chemicals (47 percent), electrical equipment and machinery (45 percent), and automobiles and parts production (43 percent). These industry-specific declines were responsible for 77 percent of the overall decline in manufacturing's share of good jobs for male workers without a bachelor's degree.⁴ Industry clusters that started with low shares of good jobs for male workers without a bachelor's degree stayed at their low levels, not falling by much.

Many commentators think increasing manufacturing employment will solve employment problems for male workers without a bachelor's degree, but that belief is misplaced. The decline in manufacturing affected the earnings of male workers without a bachelor's degree, but it is responsible for only 23 percent of the decline in all good jobs from 1960 to 2015. Manufacturing and nonmanufacturing production industries have reversed their positions as the dominant providers of good jobs for male workers without a bachelor's degree. In 1960, manufacturing industries provided exactly half of the good jobs, while nonmanufacturing production industries provided 31 percent. By 2015, the manufacturing share of good jobs for male workers without a bachelor's degree dropped nearly half, to 27 percent, while that share for nonmanufacturing production industries increased to 46 percent. This is a clear indicator that the focus on manufacturing as the source of today's good jobs is misplaced.

Conclusion

In the minds of many Americans, the eroding relative economic position of male workers without a four-year college degree and the decline in US manufacturing employment are closely linked. The earnings of men without a college degree were relatively stagnant between 1980 and 2015, and the share of those men earning enough to comfortably support a family fell markedly. Meanwhile, manufacturing employment for men without a bachelor's degree has declined precipitously, from just under 37 percent in 1960 to just over 15 percent in 2015.

Manufacturing's image as the most important source of good jobs is based on several relationships from the 1960s, when it provided 37 percent of all jobs for men without a bachelor's degree and 56 percent of all good jobs for these men. The unionized labor forces in aircraft production, motor vehicles and parts, steel, machinery, and chemicals seemed to pay professional salaries once overtime was included. But these workers' success didn't translate to similar earnings in other manufacturing industries.

By 2015, the share of male workers without a bachelor's degree in manufacturing industries fell almost 21 percentage points, to just over 16 percent. Some see this shift as the cause of economic hardship for men without a bachelor's degree. But the effect of a declining manufacturing sector is only responsible for a quarter of the earnings decline for men without a bachelor's degree. In terms of industries, only 6.5 percent of male workers without a bachelor's degree moved out of manufacturing and into low-paying service and retail jobs. Lateral movements to nonmanufacturing production industries and high-end services account for the rest of the decline. In terms of occupations, the share of men without a bachelor's degree in blue-collar jobs fell only 14 percentage points, because some of the loss of manufacturing's blue-collar jobs went to nonmanufacturing production industries. Further, a 10 percentage-point rise in middle-skill, nonmanual jobs offset much of the decline in blue-collar jobs, and in terms of pay, this is a lateral move. Finally, the decline of just over 13 percentage points in the share of good jobs for men without a bachelor's degree occurred because of changes in earnings within industries rather than because of a movement from manufacturing to low-paying service and retail employment.

Some researchers believe that foreign trade is responsible for the relative earnings decline of male workers without a bachelor's degree, but the evidence is decidedly mixed. Bivens (2013, 2) presents the most negative findings that “growing trade with less-developed countries lowered wages in 2011 by 5.5 percent—or by roughly \$1,800—for a full-time, full-year worker earning the average wage for workers without a four-year college degree.”

Others who have looked at this issue find that foreign trade had a much smaller effect. Two researchers from the US International Trade Commission in 2014 used a slightly different approach to review previous studies on this issue and found that the North American Free Trade Agreement's effects on American wages were slightly positive (De La Cruz and Riker 2014). The Congressional Budget Office (2016, 13) said that trade had “modest, but generally positive, indirect effects on the U.S. economy, increasing productivity, average wages, output, and consumer spending slightly.” Recently,

the *New York Times* explained how foreign trade was only one of six factors that led to lower earnings for male workers without a bachelor's degree.⁵ Dani Rodrik (2018) in *Straight Talk on Trade* argues that, in terms of hyper-globalization, "trade is only weakly implicated in deindustrialization and [rising] income inequality." Finally, Paul Krugman reflects the more common view among economists that "protectionists almost always exaggerate the adverse effects of trade liberalization. Globalization is only one of several factors behind rising income inequality, and trade agreements are, in turn, only one factor in globalization."⁶

The argument that our trade imbalance hurts men without a bachelor's degree is based on the premise that trade leads to losing manufacturing jobs. Hence, the data presented here show that declining manufacturing employment certainly had negative effects. But the data presented in Rose (2018a) show that approximately 90 percent of manufacturing's declining share in employment is because of technological change, not trade. Further, Rose (2018b) showed that doing away with our trade deficit would, at most, lead to another 2–3 million manufacturing workers. But only half of manufacturing employment in 2015 consisted of blue-collar jobs that would most suit men without a bachelor's degree. In contrast, 70 percent of manufacturing employment in 1960 was in blue-collar jobs.

Because manufacturing employment is unlikely to provide many new jobs in the future (Rose 2018a), other strategies to help men without a bachelor's degree need to be used. The starting point is to recognize that many men without a bachelor's degree have moderate skill levels: almost half of this group have a certificate, two-year degree, or one to three years of college. Many of these workers can thrive in middle-skill, nonmanual jobs in high-end services.

Another strategy could create higher paying jobs in low-end services and retail industries. Carré and Tilly (2017) show that different companies in the US pay vastly differently for what appear to be similar jobs (e.g., Costco versus Walmart). Further, other countries with effective high minimum wages have higher salaries for low-end service work. In the same vein, Mandel (2017) also finds that many new jobs in Amazon and other e-commerce sites pay considerably more than those in traditional big-box retailers.

Finally, it is still worthwhile to prepare young men without a bachelor's degree for blue-collar jobs. As discussed, the nonmanufacturing production industries of construction, transportation, utilities, warehousing, and wholesaling have twice as many men without a bachelor's degree in blue-collar jobs than do manufacturing industries. Funding these industries' training and apprenticeship programs is more promising than just increasing manufacturing employment.

Notes

¹ For another perspective on the relative changes on the white male working class, see Rose (2017).

² I call this group "production industries" because they have high shares of blue-collar occupations almost equal to the blue-collar share in manufacturing.

- ³ The 25th percentile of earnings for male managers and professionals presented similar findings.
- ⁴ I arrive at this number by estimating how many good jobs there would be in 2015 if the good-job shares by industry were at their 1960 levels. In other words, the overall manufacturing share of good jobs would have declined by only 3 percentage points rather than 13.
- ⁵ Karl Russell, Ben Casselman, Patricia Cohen, Conor Dougherty, and Noam Scheiber, “[6 Reasons That Pay Has Lagged Behind U.S. Job Growth](#),” *New York Times*, February 1, 2018.
- ⁶ Paul Krugman, “[Trade and Tribulation](#),” *New York Times*, March 11, 2016.

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