

How Has Job Polarization Contributed to the Increase in Non-Participation of Prime-Age Men?*

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Abstract

Non-participation among prime-age men in the U.S. has doubled from 6 percent in 1976 to 12 percent in 2016. Over these four decades, there have also been rapid increases in the employment shares of low- and high-skill jobs, while the employment share of middle-skill jobs has declined in the U.S. labor market. This aggregate shift in the composition of jobs, known as “job polarization,” may be contributing to the long-term trend of increasing non-participation among prime-age men. To investigate, we first analyze four decades of data from the Current Population Survey to characterize the relationship between job polarization and the decline in labor force participation among prime-age men. Then, we construct a labor-search model with heterogeneous sectors and individuals, and occupational choice. In the model, job polarization leads to an increase in the demand for better-educated workers and a decline in the demand for less-educated workers who are employed in middle-skill jobs. Some middle-skill workers transition to high-skill occupations, while others move to low-skill service sector jobs. However, some of the displaced middle-skill workers permanently drop out of the labor force as they are not willing to accept low-wages at service sector jobs. Our aim is to quantify the contribution of job polarization to the long-term increase in non-participation among less-educated workers, which is a key element of the long-term decline in the labor force participation rate of prime-age men. In order to stabilize and potentially reverse the trend, labor market policies need to provide incentives and opportunities for workers in middle-skill jobs to obtain the necessary skills to become qualified for high-skill jobs.

Keywords: job polarization, labor force participation rate, prime-age men, skills, skill-biased technological change, demand and supply of labor, occupational choice

JEL Classification: E24, E32, J21, J24, J62

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1 Introduction

Labor force participation among men ages 25 to 54 in the U.S. has declined dramatically since the 1970s. The share of prime-age men (ages 25 to 54) who are either working or actively looking for work decreased from 94 percent in 1976 to 88 percent in 2016 (Figure 1). The increase in non-participation among prime-age men has been a long-term trend, but it accelerated during the Great Recession with large-scale layoffs in construction and manufacturing.

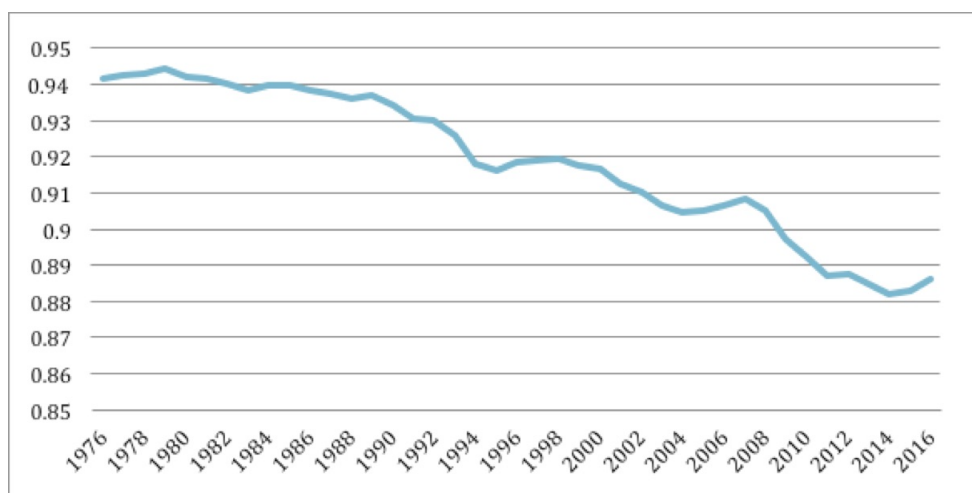


Figure 1: Labor Force Participation Rate of Prime-Age Men

Notes: CPS data, authors' calculations

Prime-age individuals are at their most productive in terms of their working years. Therefore, understanding the reasons behind the decline in their participation rates has implications for not only these individuals' earnings and well-being at the micro level, but also for economic growth, productivity, and rise in income inequality at the macro level.

Labor force participation trends for prime-age men have varied for different education groups. While participation fell for all education groups, the largest decline was among those with lower educational attainment (Figure 2). The participation rate among prime-age men with a high-school degree fell from 96 percent in 1976 to 85 percent in 2016. Similarly, the participation rate among prime-age men with less than a high-school degree fell from 88

percent in 1976 to 79 percent in 2016. For prime-age men with a college degree and more, the decline in participation was modest, falling from 97 percent in 1976 to 94 percent in 2016.

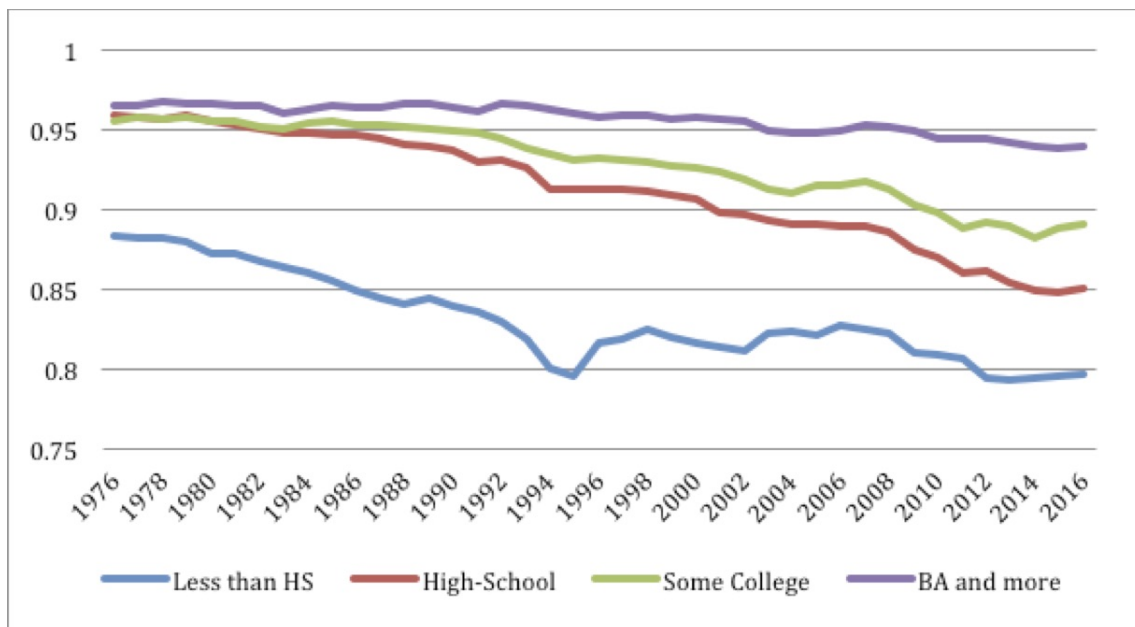


Figure 2: Labor Force Participation Rate of Prime-Age Men by Educational Attainment

Notes: CPS data, authors' calculations

What is behind the decline in labor force participation of prime-age men? According to Juhn et al. (1991) and Juhn et al. (2002), the secular decline in real wages of less-skilled men is a major reason for the decline in their participation in the labor force. They argue that there has been a steep decline in the demand for low-skilled workers, which led to high rates of unemployment, labor force withdrawal, and long spells of joblessness for men with low educational attainment. Using data for 1968-2001, they show that the increase in non-participation among prime-age men was due to low levels of real wages and an expansion of the disability benefits.

Aguiar and Hurst (2016) document the rise in non-work and non-school time by younger men between ages 21 and 30. Again, men who decreased their work time were those with less than a college degree. They argue that improvements in video game technology raised

the value of leisure for younger men. This led to a decline in their labor supply and a more elastic response to falling real wages. Quantitatively, they find that the change in the value of leisure due to improvements in video game technology accounted for 20 to 45 percent of the observed decline in the work hours of younger and less-educated men.

According to Krueger (2016), for many prime-age men who are out of the labor force, physical, mental, and emotional health challenges were a barrier to work. In particular, nearly half of non-participating prime-age men take pain medication on a daily basis, and in nearly two-thirds of cases they take prescription pain medication. As such, disabilities and daily pain were a barrier to regular employment for many prime-age men who are out of the labor force. Also, as in Aguiar and Hurst (2016), he finds that improvements in video game technology increased the enjoyment young men derive from leisure, which in turn, decreased their labor supply.

Another explanation for the declining participation among prime-age men can be changes in labor demand in response to advancements in technology. Over the past four decades, there has been a large shift in the composition of jobs in the U.S. labor market. The employment share of middle-skill jobs has fallen significantly, while there have been rapid increases in the employment shares of low- and high-skill jobs. This aggregate shift of employment away from middle-skill jobs, and toward low- and high- skill jobs is called “job polarization” (Goos and Manning (2007), Autor et al. (2006), Autor (2010), Acemoglu and Autor (2011), Jaimovich and Siu (2012), Foote and Ryan (2012)).

In this paper we argue that job polarization has contributed to the decline in the labor force participation rate of prime-age men. As computers and new technology replaced middle-skills jobs, workers in these jobs shifted toward low- and high-skill jobs. However, job polarization affected men and women differently. As documented in Tüzemen and Willis (2013), in response to the decline in the employment share of middle-skill occupations, employment of women has skewed toward high-skill occupations, while employment of men has shifted proportionally toward low- and high-skill occupations. The rising employment share

of women in high-skill occupations has been supported by significant increases in educational attainment of women. Educational attainment of men has risen more modestly, in line with the modest shift of male employment toward high-skill jobs.

Job polarization led to an increase in the demand for better-educated workers and a decline in the demand for less-educated workers who were employed in middle-skill jobs. Some displaced middle-skill workers were able to transition to high-skill occupations, while others moved to low-skill service sector jobs. However, some of the displaced middle-skill workers permanently dropped out of the labor force as they were not willing to accept low-wages at service sector jobs. We argue that job polarization contributed to an increase in non-participation among less-educated workers, leading to the decline in the labor force participation rate of prime-age men.

Aaronson et al. (2014) provide some explanatory empirical evidence supportive of the relationship between job polarization and non-participation. They find that the participation rates among less-educated adults fell more in states with a greater decline in the middle-skill employment shares, and the elasticity is greater for these groups than for the participation rates among better-educated adults.

Similar to Aaronson et al. (2014), we first empirically show the relationship between the rise in non-participation among prime-age men and the declining employment share of middle-skill jobs. Then, we present a model to describe how job polarization leads to unemployment and non-participation among the displaced middle-skill workers. Our aim is quantify the contribution of job polarization to the increase in non-participation among prime-age men in the past four decades. Lastly, we discuss how policy can help stabilize and potentially reverse this trend. More specifically, labor market policies need to provide incentives and opportunities for workers in middle-skill jobs to obtain the necessary skills to become qualified for high-skill jobs.

2 Job Polarization

Businesses have fundamentally changed the way they operate and the types of workers they require with the adoption of computers and associated technologies. Technological advances help explain why the employment share of middle-skill occupations has fallen so sharply. Workers in middle-skill occupations typically perform routine tasks that are procedural and rule-based. Therefore, these occupations are classified as routine occupations. These routine tasks have become automated by computers and machines (Autor et al. (1998), Autor et al. (2003), Acemoglu and Autor (2011)).

In contrast, tasks performed in high-skill occupations cannot be automated, making them non-routine occupations. New technologies have increased the relative productivity of workers in high-skill jobs, complementing their skill sets. Workers suitable for these positions are typically highly educated and can perform tasks requiring analytical ability, problem solving and creativity. They work at managerial, professional and technical occupations, such as engineering, finance, management and medicine. As a result of technological advancements, more high-skill jobs have been created (Acemoglu (1998) and Acemoglu (2002)). More precisely, the employment share of workers in high-skill jobs increased by 14 percentage points, rising from 29 percent in 1976 to 43 percent in 2016 (Figure 3).

Similarly, tasks performed in low-skill occupations cannot be automated, and the demand for workers to fill low-skill jobs increased. Workers in these jobs typically have no formal education beyond high school. They work in occupations that are physically demanding and cannot be automated. Many of these occupations are service oriented, such as food preparation, cleaning, and security and protective services. The employment share of low-skill jobs rose from 14 percent in 1976 to 19 percent in 2016.

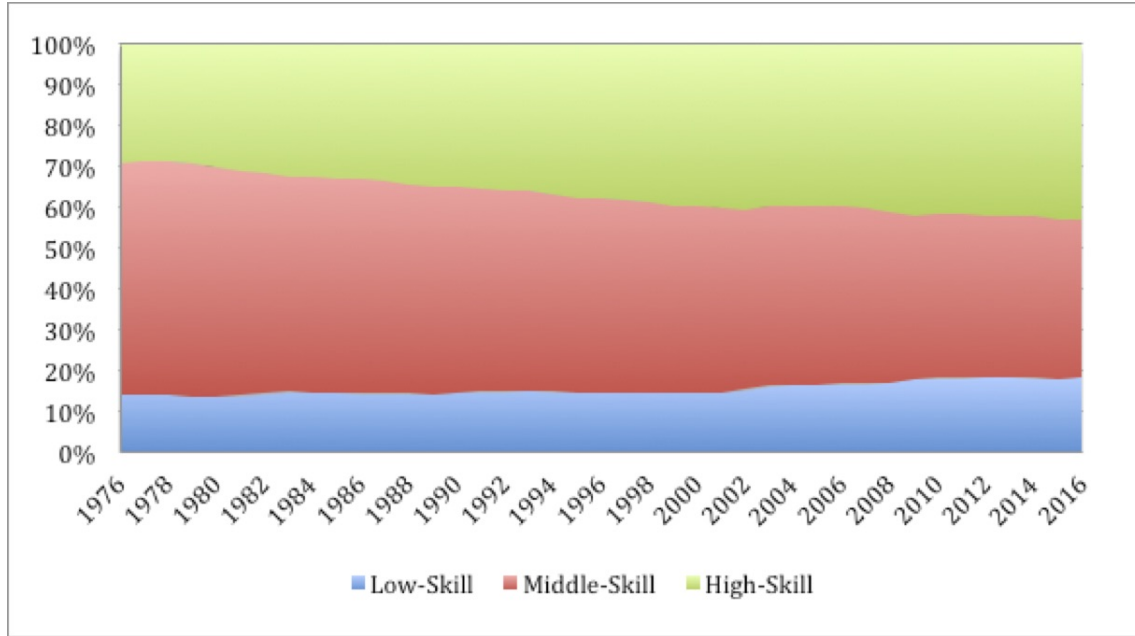


Figure 3: Employment Shares by Skill-Level

Notes: CPS data, authors' calculations

While the employment shares have increased for low- and high-skill jobs, the employment share has declined for middle-skill jobs. These middle-skill jobs include occupations, such as sales, office and administrative support, production, construction and extraction, installation, maintenance and repair, transportation and material moving. The technical change that boosted the demand for high-skill jobs also contributed to a big fall in the demand for middle-skill jobs, as computers and machines became cost-effective substitutes for workers in middle-skill jobs. The employment share of middle-skill occupations dropped by 19 percentage points, from 57 percent in 1976 to 38 percent in 2016.

International trade and weakening of unions have also contributed to the decline in middle-skill occupations. Many jobs in this category, particularly those in manufacturing, have been off-shored to countries where workers can perform similar tasks for lower wages (Goos et al. (2011), Oldenski (2012)). In addition, some firms have been contracting out portions of their businesses to workers in foreign countries, a phenomenon known as outsourcing. De-unionization has also potentially contributed to the decline in the employment

share of middle-skill jobs (Autor (2010)).

3 Data

The main data used in this study are from the Current Population Survey (CPS), also known as the household survey. The CPS is the primary source of labor force statistics and demographic data for the population of the United States. The data contain detailed demographic information on workers, as well as information on employment by industry and occupation. The U.S. Census Bureau collects survey data at a monthly frequency from approximately 60,000 households. The survey has a response rate ranging between 91 to 93 percent, which is one of the highest response rates among government surveys. The historical data are available through several public resources, and new micro-data files are published online frequently.

For the statistics related to job polarization, the data are restricted to workers between ages 16 and 64 who are not self-employed and are not employed in military or agricultural occupations. For the statistics related to prime-age men, the data are for men ages 25 to 54. The analyses are based on annual data from 1976 to 2016. To construct annual series monthly observations are averaged for each year.

4 Model

We construct a labor-search model with heterogeneous sectors and individuals, and occupational choice. We follow the search-and-matching framework of Diamond (1982), Mortensen (1982), and Pissarides (1985). Individuals differ in their educational attainment (with a college degree and without a college degree) and their disutility of work. An individual can be employed and working, unemployed and searching for a job, or not participate in the labor force. Sectors differ in the occupations they offer which demand different tasks: non-routine cognitive occupations (high-skill), routine occupations (middle-skill), non-routine manual occupations (low-skill). Search is directed. Better-educated individuals (with a college degree)

search for middle-skill and high-skill occupations, while less-educated individuals (without a college degree) search for low-skill and middle-skill occupations.

Over time, job polarization leads to an increase in the demand for better-educated workers and a decline in the demand for less-educated workers who were employed in middle-skill jobs. As a result, some better-educated middle-skill workers transition to high-skill occupations, while some less-educated move to low-skill service sector jobs. However, some of the less-educated middle-skill workers drop out of the labor force as they are not willing to accept low-wages at low-skill jobs. Our aim is to quantify the contribution of job polarization to the increase in non-participation among less-educated workers, leading to the decline in the labor force participation rate of prime-age men.

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