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WILL IMPORTS AND ROBOTS PUSH OLDER WORKERS INTO NONTRADITIONAL JOBS?

By Matthew S. Rutledge, Gal Wettstein, and Sara Ellen King*

Introduction

Recent research has called attention to workers in nontraditional jobs – defined here as jobs without retirement and health benefits, particularly those with volatility in hours or wages. At the same time, U.S. workers are facing growing competition from trade and automation. The question is: are trade and automation pushing more workers into nontraditional jobs? This issue may be a particular concern for older workers, who increasingly need longer careers with continued access to retirement plans and health coverage to secure an adequate retirement.

To explore the relationship between trade, automation, and nontraditional work, this *brief,* based on a recent study, tests whether workers are more likely to be in nontraditional jobs, or to transition to such jobs, in states that have greater exposure to trade and automation.[1]

The discussion proceeds as follows. The first section defines nontraditional work and presents trends in trade and automation. The second section describes the analytic approach. The third section reports the results, which show no evidence that a rise in import competition leads workers to end up in – or switch to – nontraditional jobs. However, some evidence suggests that automation does have an effect, particularly for older workers relative to mid-career workers. The final section concludes that as automation continues to increase, nontraditional jobs may grow more common, underscoring the need for alternative sources of retirement saving and health insurance coverage.

Background

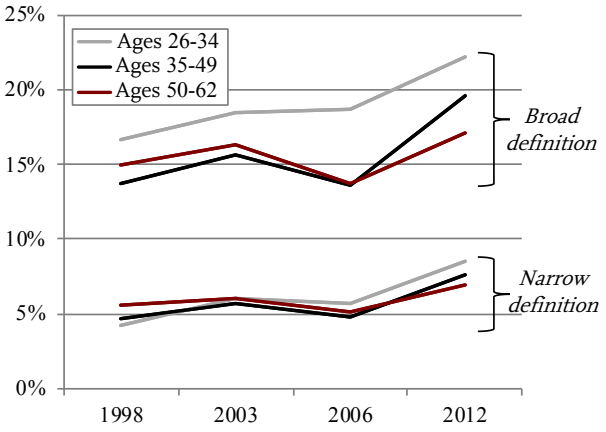
Researchers define nontraditional jobs in various ways, including gig-economy jobs, on-call work, temporary positions, part-time slots, and/or self-employment. Not surprisingly, then, estimates of the prevalence of nontraditional jobs vary from 2 percent to 40 percent of all jobs.[2]

Most definitions of nontraditional jobs focus on the worker's relationship to the employer. This *brief* instead looks at the characteristics of the jobs. Specifically, the analysis uses two definitions of nontraditional jobs: 1) those without a retirement plan and health insurance (the "broad" definition); and 2) those without these benefits *and* with volatility in employment, hours, or earnings (the "narrow" definition).[3]

* Matthew S. Rutledge is an associate professor of the practice of economics at Boston College and a research fellow of the Center for Retirement Research at Boston College (CRR). Gal Wettstein is a research economist at the CRR. Sara Ellen King is a former research associate of the CRR.

Under both definitions, nontraditional jobs appear to have increased modestly over recent decades, consistent with the findings of other research (see Figure 1).[4] The trends are similar by age, except that young workers are disproportionately in these jobs under the broad definition, which is not surprising given that they have less work experience and faced a particularly difficult labor market right after the Great Recession.[5] The implications of the growth in nontraditional jobs are still emerging, but another recent Center study found that older workers in these jobs ended up with less retirement income.[6]

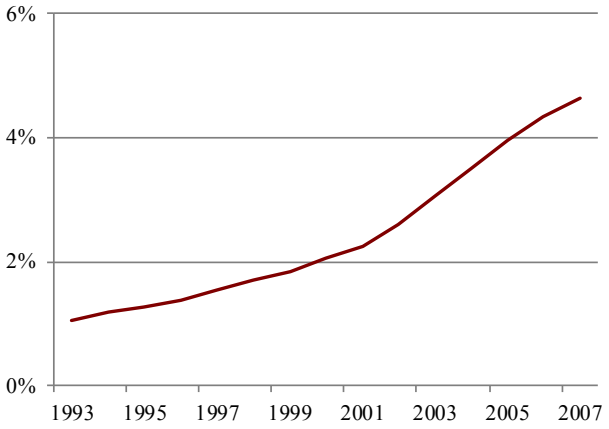
Figure 1. Percentage of Workers in Nontraditional Jobs, by Age and Definition, 1998-2012



Source: Authors' calculations from U.S. Census Bureau, *Survey of Income and Program Participation* (SIPP) (1996-2008 panels).

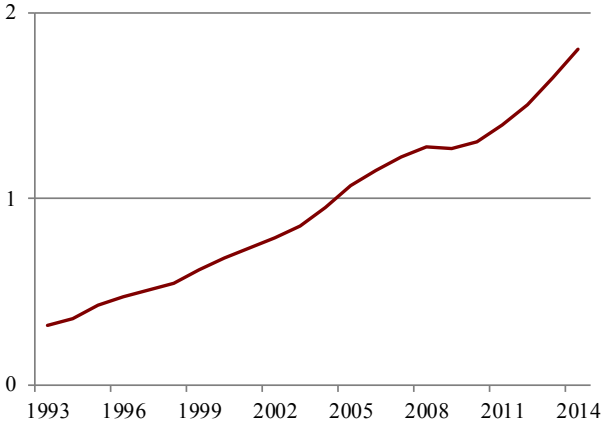
Two potential contributors to the rise in nontraditional jobs are import competition and automation, which could put downward pressure on the wages and/or benefits of U.S. workers. Both imports and automation have increased substantially in recent decades (see Figures 2a and 2b). To gauge workers' exposure to trade, the analysis uses a measure based on Chinese imports to the United States, which increased suddenly and dramatically following China's accession to the World Trade Organization.[7] The automation measure is the number of industrial robots per 1,000 workers for 19 different industries.[8] Both the trade and the automation variables are aggregated to the state level.

Figure 2a. Import Penetration Ratio for Goods from China to the United States, 1993-2007



Note: The import penetration ratio is U.S. spending on goods from China relative to all U.S. spending on goods.
Source: Autor, Dorn, and Hanson (2013).

Figure 2b. Industrial Robots per 1,000 Workers in the United States, 1993-2014



Source: Acemoglu and Restrepo (2017).

Prior research has looked at the effects of trade and automation on some employment-related indicators.[9] For example, one study found that manufacturing workers who were most exposed to import competition experienced more churn.[10] Similarly, other research showed that local labor markets exposed to automation saw employment and wage losses.[11] However, no previous studies have examined whether trade and automation push workers into nontraditional jobs.

Relating Nontraditional Jobs to Trade and Automation

The key question for this study is whether import competition and automation are associated with more nontraditional work. To assess these relationships, the analysis uses the *Survey of Income and Program Participation* from 1998-2012 to examine the share of workers ages 26-62 in nontraditional jobs and the share transitioning from a traditional to a nontraditional job. With these data, the analysis estimates two regression models that control for the business cycle.

The first model (a static analysis) looks at the relationship between the percentage of workers in nontraditional jobs in a state in any given year and exposure to trade and automation in a worker's state using a probit regression. This model is estimated using both definitions of nontraditional work – broad (jobs without retirement and health benefits) and narrow (jobs without these benefits *and* with volatility in work schedules or earnings). The basic equation is:

Percentage of workers in nontraditional jobs in a state by year = f (trade, automation, job characteristics, demographics, state, year)

In addition to the main independent variables of trade and automation, the controls include other job and personal characteristics. Furthermore, to assess whether older workers are particularly impacted by automation and trade, this model is also estimated by age group, again under both definitions of nontraditional work.

The second model (a dynamic analysis) focuses on whether the same factors push workers from traditional to nontraditional jobs. It is identical in structure, but the sample is limited to those who start out in traditional jobs. This model is also estimated under both definitions of nontraditional work.

Overall, for each definition of nontraditional work, the analysis yields estimates for the static and dynamic models for workers of all ages (the full sample) and for workers broken out by separate age groups.

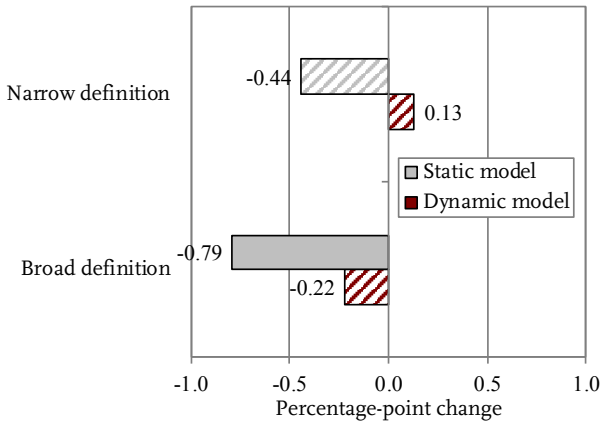
Results

The overall results are mixed. They do not support the hypothesis that increased competition from trade leads to more nontraditional work. However, they do offer some support for the notion that automation leads to more nontraditional jobs.[12] In addition, the results suggest that this relationship is stronger for older workers than for mid-career workers.

Trade

The trade results for the full sample show no evidence that increased imports from China lead to more nontraditional jobs – on the contrary, they suggest that more trade is associated with fewer such jobs. This finding is marginally statistically significant in one of the four estimates (see Figure 3).

Figure 3. Association of Trade with Nontraditional Jobs by Definition and Model Type

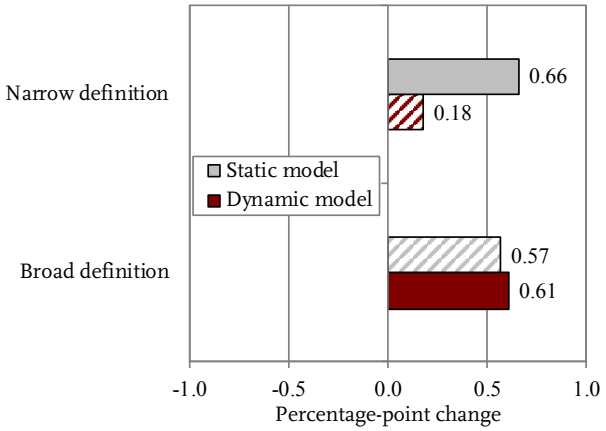


Note: Solid bars are significant at the 10-percent level.
Source: Rutledge, Wettstein, and King (2019).

Automation

The automation results suggest that having more robots per worker is associated with more nontraditional jobs. Both the static analysis – measuring the prevalence of nontraditional jobs overall – and the dynamic analysis – measuring the prevalence of switching to a nontraditional job – indicate a positive relationship with automation. The result for the static analysis is statistically significant at the 10-percent level using the narrow definition of nontraditional work, while the result for the dynamic analysis is similarly significant using the broad definition (see Figure 4). For example, in the static analysis, a one-standard deviation increase in the use of industrial robots is associated with a 0.7-percentage-point increase in nontraditional work, narrowly defined.

FIGURE 4. ASSOCIATION OF AUTOMATION WITH NONTRADITIONAL JOBS BY DEFINITION AND MODEL TYPE



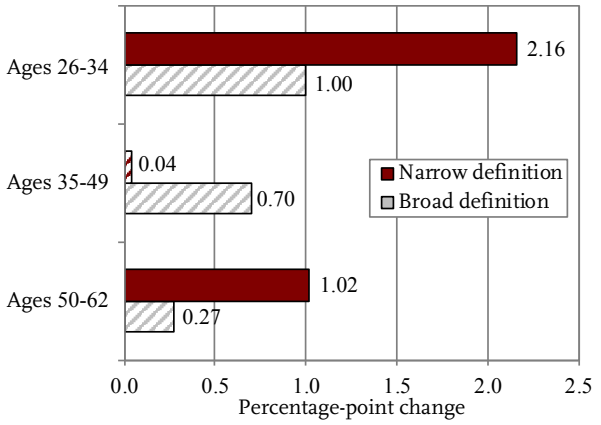
Note: Solid bars are significant at the 10-percent level.
Source: Rutledge, Wettstein, and King (2019).

These results may understate the relationship between nontraditional work and automation because industrial robot use is only one component of automation's effect on employment. In short, if measured more comprehensively, automation may have grown faster than indicated in this analysis.

Results by Age

In terms of the impact by age, the results discussed here are limited to the static model estimates for the relationship between automation and nontraditional jobs. Excluded are the results for trade (which, again, show no evidence of a positive relationship) and the dynamic model (as none are statistically significant).

FIGURE 5. ASSOCIATION OF AUTOMATION WITH NONTRADITIONAL JOBS IN STATIC MODEL BY DEFINITION AND AGE GROUP



Note: Solid bars are significant at least at the 10-percent level.
Source: Rutledge, Wettstein, and King (2019).

The results for the static model show that – relative to mid-career workers – the share of older workers in nontraditional jobs is higher in states where automation is more prevalent (see Figure 5). For example, being an older worker is associated with a statistically significant 1-percentage-point increase in the likelihood of being in a nontraditional job (under the narrow definition) for a 1-standard deviation increase in automation, with no such relationship for workers ages 35-49. Not surprisingly, the workers ages 26-34 display an even stronger association between automation and nontraditional work, as those who are early in their careers are more likely to have low-skill, routine jobs that are vulnerable to automation.

Conclusion

Concern about nontraditional jobs has grown, especially with the potential for growing competitive pressures from trade and automation. The results of this analysis suggest a positive relationship between automation – defined by an increased use of robots – and nontraditional jobs, with older workers seeing a larger impact than mid-career workers. On the other hand, import competition is not associated with greater use of nontraditional work.

The main takeaway is that continuing growth in automation may reduce workers' bargaining power, which could allow employers to offer more lower-quality jobs. Older workers who have trouble extending their careers in traditional employment may find that they have to settle for jobs that do not include retirement saving and health insurance benefits, underscoring the need for alternative sources of coverage to help workers obtain a secure retirement.

Endnotes

1 Rutledge, Wettstein, and King (2019).

2 Research on nontraditional work dates back decades (e.g., Barker and Christensen 1998) but has become more prominent recently; see Collins et al. (2019); Katz and Krueger (2016, 2019); Abraham et al. (2018); Jackson, Looney, and Ramnath (2017); Farrell and Greig (2017); Robles and McGee (2016); and U.S. Government Accountability Office (2015).

3 For more on the different definitions of nontraditional work, see Munnell, Sanzenbacher, and Walters (2019) and Rutledge, Wettstein, and King (2019).

4 For example, Osterman (2013) finds that jobs are more likely to lack fringe benefits and have unpredictable wages. Also, see Katz and Krueger (2019) and Munnell, Sanzenbacher, and Walters (2019).

5 See Munnell and Hou (2018).

6 Munnell, Sanzenbacher, and Walters (2019).

7 This definition follows Autor, Dorn, and Hanson (2013). For more on the these variables in the current context, see Rutledge, Wettstein, and King (2019).

8 This definition follows Acemoglu and Restrepo (2017). For more details on these data, see Rutledge, Wettstein, and King (2019).

9 Ongoing Sloan-funded work by Richard Freeman and colleagues examines the extent to which automation affects employer demand for older workers, but does not focus specifically on whether those firms create nontraditional jobs for those workers. Other papers in this vein include Acemoglu and Restrepo (2018); Autor and Salomons (2018); Graetz and Michaels (2018); Wettstein, Rutledge, and Hou (2018); and Hemous and Olsen (2014).

10 See Autor et al. (2014). This literature is large and growing; see also Acemoglu et al. (2016); Bloom, Draca, and Van Reenen (2016); Pierce and Schott (2016); and Balsvik, Jensen, and Salvanes (2015).

11 Acemoglu and Restrepo (2017).

12 For full results, see Rutledge, Wettstein, and King (2019).

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Contact Information

Center for Retirement Research
Boston College
Hovey House
140 Commonwealth Avenue
Chestnut Hill, MA 02467-3808
Phone: (617) 552-1762
Fax: (617) 552-0191
E-mail: crr@bc.edu
Website: https://crr.bc.edu

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