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DISCUSSION PAPER SERIES

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ABSTRACT

Improving Employment and Earnings in 21st Century Labor Markets: An Introduction*

What are the prospects for improving the lot of US workers in the 21st century? This introduction to the topic examines the most important US labor market trends of the late 20th and early 21st centuries, considers their causes and likely future trends; and then explores policies that might improve these outcomes. The most important broad labor market trends in recent decades have been: 1) Modest real wage growth; 2) Rising earnings inequality; and 3) Declining labor force participation, recently among both men and women, but especially among less-educated or African-American men and low-income youth over several decades. Key causes of these trends include labor demand and supply factors (such as automation, immigration, and limited college attainment); changing labor market institutions (such as declining unionism and stagnant federal wage/hours laws); rising alternative staffing arrangements, informal work and "fissuring"; and uneven labor market progress and policies affecting women, African-Americans and the young. After that review, we summarize what the papers in our volume tell us about the public policies that could help improve outcomes for US workers. The main message is that further deterioration in many US workers' lives in the 21st century likely requires public and employer policy changes to help to translate the forces at work into better outcomes for them.

JEL Classification: J01, J08, J2, J5

Keywords: employment, earnings, inequality, labor force

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Introduction

How have US workers fared recently? Broadly speaking, not so well. The employment and earnings outcomes of most Americans in the late 20th and early 21st century have been disappointing. Over the past four decades, average real wage growth has been modest; wage inequality has risen dramatically; and labor force activity has declined, especially among less-educated workers. Indeed, looking at five-year intervals over this span, only during the mid-to-late 1990s – when the US economy was enjoying its "dot-com" boom – has the US seen significant real earnings growth or increases in labor force activity, especially among less-educated men.

What accounts for the modest real wage growth, rising wage inequality, and falling labor force activity that we have experienced? Looking forward, should we expect more of the same? How will new developments, like the automation of workplaces associated with artificial intelligence (AI) and demographic shifts affect these outcomes? And what should sensible public policy look like to enable us to adjust to the coming changes and improve outcomes for most workers?

Given their centrality to most American families' future economic well-being, these questions warrant attention. Thus, the Russell Sage Foundation sponsored a conference on "Improving Employment and Earnings in 21st Century Labor Markets" on September 21, 2018. The papers presented there appear in this volume. We hope that these descriptions of the labor market's current and future trajectories as well as policy options will spur conversations, analysis and action by academics, policymakers, employers and the public. We believe that course corrections are possible and advisable. Appropriate policies and employer choices could improve outcomes for all, and particularly for those who are disadvantaged and whose employment outcomes have deteriorated in recent years.

In this introduction, we set the stage for the ten topical papers that follow by describing the three key US labor market trends in recent decades and what we know about their determinants. We also speculate a bit about the likely impacts of coming changes in automation and demographics and consider policy

choices available to respond to the economic forces in play. Then we review contributions made by the papers to our understanding of current trajectories and policy options. We conclude with some key takeaways.

I. Recent Labor Market Outcomes and Their Determinants

The most apparent broad labor market outcomes in employment and earnings since the late 1970s are:

1) Modest real wage growth
2) Rising wage inequality
3) Declining labor force activity, especially among less-educated Americans

1) Modest Real Wage Growth

Since 1979, most US workers' real (that is, inflation-adjusted) wages have stagnated. Figure 1 presents the dismal pattern of mean and median real wages from 1979 to 2016.[1] Indeed, only the second half of the 1990s shows any sustained real wage growth.[2] The general flatness of wages for the average US worker over a period of nearly four decades is quite astounding, and historically unprecedented.

What might account for the recent flatness of wages? In a strict accounting sense, the following three factors can largely account for the pattern:

- Low productivity growth;
- A decline in workers' share of US income; and

[1] The figures we use below have been generously provided to us by Jay Shambaugh and Ryan Nunn of the Hamilton Project at the Brookings Institution. Wages are deflated by the CPI-U-RS in Figure 1. The CPI-U-RS is not constructed to accurately measure cost-of-living differences over such a long time period. Thus, it is more appropriate to compare the pace of real earnings growth over short time periods. Note, however, that real wage trends using other price indices, like the chain-weighted GDP deflator for personal consumption expenditures (Holzer and Hlavac 2014) show qualitatively similar though somewhat larger real wage increases over time.

[2] The stronger real wage growth we observe in the mid-to-late 1990s occurs due to a temporary confluence of strong productivity growth, tight labor markets and low inflation that have not been observed at any other time in the past four decades.

- Rising health care benefit costs as a share of total compensation.[3]

Labor productivity growth has averaged under 2 percent per year since 1973, which is well below its average in the years after World War II. Indeed, excluding the decade around the "Dot Com" boom, it averages just 1.5 percent, and since 2007 has been 1.2 percent (Baily and Montalbano 2016).

With such slow growth in output per worker, it is perhaps not surprising that growth in worker wages has lagged as well – since real wage growth remains quite correlated with, though lower than, productivity growth in this period (Stansbury and Summers 2017). Yet, because compensation growth has been at least somewhat decoupled from productivity growth since the late 1970s, higher productivity growth alone is apparently not sufficient for raising wages. It may not even be necessary for such growth, though rising real wages would require some redistribution away from profits (or lower benefit costs) absent higher productivity growth.

Thus, the recent decline in labor's share of output (from about 64 in 1973 to 57 percent in 20??) also clearly contributes to low overall wage growth. Likewise, the growth of the share of worker compensation accounted for by health care costs also reduces wages, though this factor does not appear to have been consistently larger in the decades since 1979 than in those before that year.[4]

The questions of why productivity growth has slumped and why the share of productivity improvements going to labor has declined remain open. Hypotheses to help explain one or both developments include:

- Rising automation in the labor market (Acemoglu and Restrepo 2018; Autor 2018);
- Growth of "nearly winner-take-all" product markets where capital-intensive firms have gained substantial market share relative to those more labor-intensive (Autor et al. 2017);

[3] These three factors wouldn't exactly account for wage trends, at least partly because productivity and earnings are based on price indices which have trended quite differently in the past few decades, with that for productivity rising by much less (and thereby inflating productivity growth relative to that in earnings). They also differ partly because other benefits besides health care affect the extent to which total compensation growth differs from that in wages.
[4] Data in Burtless and Milusheva (2013) show that increases in the share of compensation accounted for by health insurance premia rose during the 1980s but then declined in the next two decades, with the post-1979 average roughly similar to that for the three decades of the 1950s through the 1970s.

- Relatively weak aggregate demand (relative to potential output) in the US economy since 1980 (Bernstein 2018);
- A slowdown of the rate of growth of education in the workforce (Goldin and Katz 2008);
- Declining dynamism of the labor market, as measured by geographic and occupational mobility of labor (as well as declining numbers of business startups – Shambaugh et al, 2018); and
- Rising labor market power of employers relative to workers and declining mechanisms for worker voice.[5]

2) Rising Wage Inequality

As overall wage growth slowed, inequality widened. The rise in wage inequality overall and across education groups has been frequently documented and researched. Figures 2-4 summarize trends that we know from this work. Figure 2 presents rates of wage growth between 1979 and 2017 across different quintiles of the wage distribution; and Figures 3 and 4 do so across education and race/gender groups respectively. The bars show the real median hourly wage (in 2016 dollars) in 1979 and 2016 for each group; and we show the percentage change in wages for each group above their two bars. As an example, the real median wage for the bottom quintile of workers fell by 0.98 percent from 1979 to 2016, while it grew by 27.41% for the top quintile. And, while benefits like health insurance have expanded since the passage of the Affordable Care Act in 2010, trends in benefit availability over a longer time suggest that inequality has grown in broader compensation measures as well as in earnings alone (Pierce 2001).

[5] Shambaugh et al. (2018) note some growing evidence of employer monopsony power in local labor markets, especially in rural and smaller metropolitan areas, though it is not clear that such power is itself growing nationally. But when these areas experience losses in local labor demand, especially through technology or globalization, such market power of employers likely imposes even greater costs on workers who face little alternative demand for their labor and may not be inclined to relocate geographically. Under these circumstances, employer monopsony power could lower labor market efficiency and productivity as well as raise inequality. There has also been some evidence of rising product market concentration of firms and higher markups above costs that, all else equal, might create opportunities for workers to share in product market rents. Of course, the ongoing implementation of digital technologies, globalization, deunionization, and deregulation limit worker abilities to share them. Finally, Shambaugh et al. also note recent evidence of growing anticompetitive behaviors by employers like non-compete and non-disclosure agreements in worker contracts, which could affect both worker productivity and inequality.

The three figures show well-known patterns of rising wage inequality in the labor market over this time. Wage growth has very clearly been highest in the top quintile of the earnings distribution; and other data show it being increasingly higher for the top 10%, 1%, and 0.1% of that distribution (Gould 2019). [6] While the third quintile enjoyed more wage growth over the entire four-decade period than did the bottom quintile, other data (Autor et al. 2008) suggest that much of this occurred during the 1980; beyond that point, inequality rose mostly between the middle and top earners, rather than between the middle and bottom earners. Real wage growth has also been substantially higher for those with bachelors' or higher education degrees than for those without college, and for women relative to men.[7] Wage growth among blacks and Hispanics lags behind that of whites, and is lowest among black men. But, if anything, these calculations understate the degree of earnings loss among men and especially black men, whose labor force participation and employment rates have also declined a great deal, as we document below.

A substantial literature tries to explain these increases in labor market inequality. Even though most analysts agree that both labor market and institutional factors are important, they continue to debate the relative importance of each (see Autor et al. 2008; Card and Dinardo 2008; and Fortin et al. 2018). The most important labor market forces shifting demand away from less-educated workers include automation (in the form of "skill-biased technical change", or SBTC) that raises the demand for highly-educated workers as it replaces the less-educated; and globalization, which includes trade as well as immigration. To a great extent, these forces have generated "polarization" in the labor market, as employment and (to some extent) wages have risen in the highest and lowest-paying jobs, while non-college-educated workers in the middle deciles of the wage distribution – especially in jobs consisting mostly of easily automatable

[6] The changes in inequality at different points of the earnings distribution are often summarized in this literature by the ratios of earnings at the 90th, 50th and 10th percentiles – so the 90/50 ratio measures inequality between the top and middle, while the 50/10 measures it between the middle and bottom. These trend quite differently over the past four decades.

[7] On the other hand, Autor (2014a) clearly indicates that the growth of the college/high school ratio within the bottom 99% of the income distribution accounts for four times the relative loss of income for high school graduates as does the rise in income for the top 1%.

routine tasks, like production and clerical work – suffered the greatest losses in both outcomes.[8] Nevertheless, skeptics of the importance of SBTC and polarization (e.g., Mishel et al. 2013) note that that the broadly weak employment outcomes after 2000, even among college-educated workers, may undercut these hypotheses. Not surprisingly, SBTC proponents (e.g., Autor, 2014b) read this evidence quite differently.[9]

However, trade and technology alone do not determine any particular employment outcome. A range of policies influence how technology and trade affect workers. In particular, the failure of the supply of highly educated labor to more substantially rise in response to higher returns to education has allowed inequality across education groups to expand recently. This stands in sharp contrast to earlier time periods in the US, when education policies helped raise the supply of skills more vigorously in response to increases in the demand for them (Goldin and Katz 2008; Autor, 2014a).[10] Policy responses can also mitigate (or not) the harm caused to workers displaced by automation. In the US, the large wealth losses (Davis and von Wachter 2011), substantial unemployment spells and frequent labor force exits (Farber 2017) sustained by displaced workers in the US attest to a workforce development system that does not sufficiently protect workers from high, long-lived costs if they lose their jobs.

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[8] Holzer (2015) points out that employment in middle-wage categories has not declined uniformly; instead, it has declined primarily in production and clerical jobs requiring no postsecondary education, while it has risen in other categories (such as health) where postsecondary credentials are required. The net decline in middle-wage employment reflects the fact that the decline of employment in the former category is larger than the rise in the latter.

[9] Autor acknowledges that employment after 2000 has mostly grown only in the lowest-wage occupations, while shrinking in the others, apparently in contrast to the polarization story that works better in the 1990s. But he notes that growth resumed in the highest-wage categories after 2007, and mostly attributes the shrinking of employment in this sector in the 2000-07 period to the bursting of the internet bubble in 2000 and after. In addition, he argues that the "China shock" to manufacturing and then the Great Recession also contributed to very low real wage growth for all workers in the decade after 2000. The very high ongoing returns to cognitive skills in the US (Autor, 2014a) are also consistent with the SBTC and polarization hypotheses.

[10] Goldin and Katz show that the rise in demand for high school labor early in the 20th century led to rapidly rising supplies of such labor within a few decades, and corresponding declines in inequality between those who had and did not have such diplomas. The greater rise in high school attainment in that period at least partly reflects policy responses, such as the movement for universal public high schools. The flatness of the college/high school wage premium since 2000 is also taken by some critics as evidence against the supply/demand story for education in the labor market,;but it can also be interpreted as the growth of the supply of college graduates finally catching up with weakening growth in demand (see Beaudry et al. 2013), though not by enough to reduce the still very high premium to any real extent.

In addition to market forces and policy mattering for outcomes, the same technology can be implemented by employers in very different ways with very different consequences, certainly for jobs and skills.[11] At various times, automation has led to de-skilling, upskilling and sometimes to both.[12] Many times, automation has a partial impact in which tasks are shared between the human and the machine – and creative approaches to managing the human-machine interface are often possible and efficient in this partial automation state.[13]

At the same time, institutional factors such as declining coverage of workers by collective bargaining and declining minimum wage levels (relative to median wages) have also contributed to rising wage inequality, perhaps playing a greater role than many economists had previously thought.[14] Other institutional changes, including various forms of labor market "fissuring" (Weil 2014) have likely added to such inequality, and threaten to do so even more in the future. These institutional forces also suggest some decline in the prevalence of employment in "high-road" firms, or those paying wage premia to workers of a given skill level above standard market rates.[15]

It is noteworthy that rising inequality in earnings and household income have characterized virtually all industrialized economies since the 1970s, which suggests an important role for factors like SBTC and

[11] Kelley and Helper (1999) provide examples of how technology adoption can vary among employers with divergent impacts for the workers involved. For more discussion of this, see Groshen et al. (2018).
[12] For example, Autor et al (2002) find that automation in banking in the U.S. in the 1990s had both effects, leading to polarization in wages among bank employees.
[13] Shimada and MacDuffie (1998) find that when humans work in close proximity to machines, their observations can yield improvement ideas that "give wisdom to the machine", which can help capital equipment appreciate (rather than depreciate) in value.
[14] Fortin et al. argue that, with a new way of measuring the spillovers of minimum wage increases and collective bargaining for workers not directly affected by those factors, the extent to which declines in those factors account for rising earnings inequality may be quite large.
[15] See, for instance, Abowd and Kramarz (1999) and Holzer et al. (2011) for evidence on firm-level wage effects that measure the payment of earnings premia above or below market levels for workers of a given skill set. Ton (2014) presents industry case studies showing strategies used by firms to improve worker productivity and earnings in "good job" settings. "High-road" firms presumably can compete with others on the basis of higher worker productivity and performance, while "low-road" firms compete on the basis of cost minimization; but evidence remains limited on the extent to which the former can fully compete with the latter (Osterman 2017).

globalization that affect all such economies (Autor 2014). At the same time, the fact that increases in inequality have generally been greater in the US than in most other countries (Autor and Katz 1999; OECD 2011) imply an important role for institutional and policy effects that are more uniquely American.

3) *Declining Labor Force Activity*

Whether people work also matters. Less equal earnings over time reflect not only trends in wage inequality, but also changes in labor force activity. Figure 5 documents trends in labor force activity since 1979, separately for men versus women and for youth (ages 16-24) versus prime-age adults (ages 25-54). Although participation among prime-age women has risen since 1979, a closer look at annual trends shows that rising participation among adult women in the US ended around 2000 and declined somewhat after that. Notably, the end of increases in labor force participation for American women, while it continued to increase in many other industrial countries, suggests that factors such as family-worklife imbalance and the unavailability of paid family leave in the US limits the workforce potential of American women in important ways (Black et al. 2017).

In addition, youths' and prime-age men's labor force activity has trended down consistently since the 1980s.[16] Only among workers at age 55 and above have raised their labor force participation recently. In particular, many college-educated workers (whose health and longevity are clearly improving) apparently want longer working lives.

Figures 6a and 6b then present separate changes in labor force participation among prime-age men by education levels and race. Clearly, less-educated men (and especially black men) account for a disproportionate share of declining activity. If anything, declines for the latter group are understated due to the under-representation of low-income and/or black men in Census survey data (US Census Bureau 2012). We might not be too concerned if these declines reflected choices by the most educated workers

[16] At least some of the growing nonparticipation of youth in the labor force reflects higher rates of college enrollment over time (Krueger op cit.). But data not presented here also show greater declines in participation among those aged 25-34 than 35-54, suggesting that other factors besides enrollment are causing these declines.

(except from a fiscal perspective, where the ratio of working to nonworking populations is very important for our ability to fund our retirement programs). However, its concentration among the young and/or least-educated imply large losses of earnings and wealth for these populations over time, and perhaps permanently.

The fact that labor force activity has declined most among the groups suffering the greatest wage declines suggests that these workers face less demand for their labor over time (Autor and Wasserman 2013, Abraham and Kearney 2018).[17] Exacerbating the impact, the concentration of less-educated men in regions hard hit by manufacturing job loss since 2000 (Austin et al. 2018) also suggest a role for a persistent lack of job availability in such regions, along with a relative lack of regional relocations among these men.[18] In addition, other factors like the availability of transfer income (especially from disability insurance) and opioid dependency likely contribute to these declines as well (Krueger 2017, Doar et al. 2017). Among black men, these forces have been compounded by ongoing gaps in educational achievement and early work experience as well as high rates of incarceration, which generate fewer job offers and lower wages for these men and therefore drive them out of the workforce in even larger numbers (Neal 2008).

Looking Ahead

The preceding section suggests that labor market and institutional forces, employer choices, as well as the extent and effectiveness of policy responses, all contribute to the modest real wage growth, rising inequality and declining labor force activity observed in the US in the past four decades. How will these and other factors evolve over the coming decades, and what would constitute appropriate policy responses?

[17] That is, the decline in participation traces out worker movements along a labor supply function in response to shifting demand.

[18] Blanchard and Katz (1992) presented evidence of regional mobility of workers in response to labor demand shocks, though Bound and Holzer (2000) showed that such responsiveness has long been lower among less-educated than highly-educated workers.

There seems no question that automation will continue, and its labor market effects may well accelerate as robotics and AI become more prevalent in American workplaces. Frank Levy (2018), among others, argues that such technologies will likely have large impacts on workplaces and employment within the next decade, as motor vehicles, manufacturing production and customer service centers become more fully automated.

Over a longer time span, AI adoption in workplaces will likely have both positive and negative effects on workers. On the one hand, automation should raise worker productivity and potentially average compensation; on the other hand, it could well further depress labor's share of national income, especially in the absence of worker "voice" and policy changes. It will likely cause more worker displacement, imposing associated costs on affected workers. Younger or more-educated workers will likely adapt to these changes by getting new forms of education and training, though older or less-educated workers are more likely to simply accept lower-wage jobs or leave the labor force entirely. The disruptions to work will likely affect workers at all levels of education. Yet, the "skill bias" that we have observed in recent decades will likely persist (Nedelkoska and Quintini 2018). This bias, which tends to disadvantage lower-skilled workers, occurs because the most routine forms of work will remain the easiest to automate and more skilled displaced workers may "bump" lower-skilled workers out of their opportunities, while also adapting by gaining new skills.[19] All else equal, these forces suggests ongoing rising wage inequality in the future.

However, not all must remain equal. For example, the abilities of workers to retrain, and perhaps keep their jobs, in the presence of automation will depend on a range of institutional and policy factors, as we noted above. Private employers' practices and the public sector policies will help determine how easily

[19] Autor (2015) describes how the magnitudes of labor cost savings, price and income elasticities of demand help determine whether new jobs are created in the automating industries or elsewhere.

entering and continuing workers can obtain the skills they need for these new or reconfigured jobs, and the speed of these transitions.[20]

Interestingly, the effects of automation in industries like retail trade to date have perhaps increased the quality of jobs while not greatly diminishing their quantity (Mandel 2017).[21] Still, if the scope and speed of displacement as the new technologies are implemented greatly exceeds those of the past, it is possible for the adjustment processes that economists emphasize to be overwhelmed, or for the net quality of jobs to be reduced at least temporarily. Indeed, as noted above, the high and uncompensated costs borne by US displaced workers suggest that current policy and employer actions are insufficient to manage the likely future pace of job destruction without harm to families and communities. All of this will likely have political as well as economic implications, perhaps feeding the rising populism observed over the past few years in the US and the European Union (West 2018) and fueling resistance to technological change on the shop floor.

On a different issue, both the pace and composition of future immigration remain very unclear at the moment, as controversies rage over potential changes in our immigration law. The impact of immigration on the earnings of native-born workers remains heavily contested. In addition, workforce demographics will likely change, especially as immigrants replace retiring "Baby Boomers" in the labor force. Whether the retirements of Baby Boomers create widespread labor market shortages, as was once widely forecast (e.g., Judy and D'Amico 1997), now seems doubtful (Freeman 2007). But the growth of minorities in and the aging of the US workforce might well further limit the levels of educational attainment of the workforce overall, absent major policy efforts to offset these changes (Frey 2015). Lower educational attainment, in turn, can limit productivity growth and raise earnings inequality.

[20] For other discussions of the adjustment process of workers to robotics see Levy and Murnane (2013) and Holzer (2017).

[21] Mandel argues that employment growth in "fulfillment centers" where goods are stocked for online shopping, plus that in transportation/logistics for workers who deliver them, pay higher wages and are large enough in quantity to offset most job loss in "brick-and-mortar" retail trade in the past several years.

The ability of our more diverse workforce to become better educated, and adaptable to coming changes in automation, will also depend crucially on future trends in federal and state education policy and funding at all levels, from pre-kindergarten programs through higher education. The effectiveness of the nation's labor exchange and workforce development system, including its American Job Centers and Unemployment Insurance, could also help determine the extent to which displaced workers learn about new job opportunities and get the skills necessary to obtain them.[22] Policies to encourage employers to provide more on-the-job training, especially to workers at risk of technological displacement, could be important too.

Another set of policy choices in the future will affect how workers share in productivity gains associated with automation. The degree of sharing will certainly depend on employer adoption of practices such as profit-sharing (Blasi, Freeman, and Kruse 2014) and various forms of worker "voice," including collective bargaining or other alternatives (Freeman, Hersch and Mishel 2004). Legal decisions, such as the recent Supreme Court ruling in Janus v. AFSCME (which struck down the ability of public sector unions to collect dues from non-members), will also affect the extent to which unions remain vital forces in the private and public sectors. In addition, new efforts to ensure protections and benefits coverage for workers in a wide variety of settings, including alternative staffing arrangements like contracting, will likely be crucial, too (Harris and Krueger 2016, Katz and Poo 2018).

Of course, statutory minimum wages (at the federal, state and local levels) and overtime laws can affect the distribution of earnings and employment. Other efforts to "make work pay," such as expansions of the Earned Income Tax Credit (EITC) and Wage Insurance, could improve both earnings and labor force participation among less-education and/or displaced workers as well.

Finally, more targeted policy choices can affect employment outcomes of specific groups of workers, and perhaps on their labor force participation, such as paid leave for women (or young parents more broadly)

[22] For discussions of potential reforms in the workforce system and Unemployment Insurance to help workers gain better skills and new jobs see Van Horn et al. (2015) and Kugler (2015) respectively.

and enhanced child care subsidies., Efforts to help less-educated young men could include opioid addiction prevention and treatment, policies limiting incarceration or helping offenders reenter the workforce, or Social Security Disability Insurance (SSDI) reform.[23] Efforts to combat "disconnection" from school and work among youth can also include a range of education and training policies, in high schools and community colleges,that we discuss below.

In short, the forces of automation and globalization are not likely to subside any time soon, potentially leading to further flat wages, rising inequality and lower labor force participation. Mitigating these consequences will require changes in policy and employer choices. Evidence in favor or against at least some of these future policy options appears in the papers of our volume below, to which we now turn.

II. Papers in this Volume

What does the best current research say about these key issues? We asked the conference authors to use past experience to both look forward and consider policy options. In line with our review above, authors wrote papers on the following topics:

A. Labor Demand and Supply Trends – Effects of automation and immigration on short-term employment; the supply of workers with higher education
B. Labor Market Institutions – Collective bargaining, other "voice" mechanisms, and "high road" employment practices; statutory minimum wage and overtime legislation
C. Alternative Staffing Arrangements – The growth of independent contracting, "temp" jobs and informal work; "fissuring" and policies to address it

[23] Krueger (2017) argues that large percentages of non-employed prime-age men use painkillers regularly. Holzer et al. (2006) argue that incarceration limits subsequent employment of offenders, especially employer demand for labor, while garnishing wages for those in arrears on child support likely reduces their supply. Abraham and Kearney (2018) estimate relatively large impacts of previous incarceration on subsequent employment losses of workers. See also Autor and Duggan (2006) as well as Liebman (2015) for discussions on how SSDI likely reduces employment among prime-age men and women.

D. Particular Demographic Groups – Trends and policies to help women, African Americans and disadvantaged youth remain attached to the workforce and achieve progress there

A. Labor Demand and the Supply of Skilled Workers

We begin with considering the effects of automation and immigration on jobs and the supply of workers with higher education.

In the first paper, George Borjas and Richard Freeman estimate the impact of industrial automation and immigration intensity, across industries and/or states, on the short-term employment and earnings of workers in the period 2004-2016. They find large negative effects of automation on employment – with each robot displacing 4-5 workers – as well as wages; while immigrant impacts on workers are also sometimes negative (especially for less-educated workers) but much smaller.

These findings are based only on their analysis of manufacturing industries, where virtually all industrial robots have been used to date, but they will no doubt spread to other sectors and grow in intensity and productivity over time. The results thus suggest the potential for automation to generate considerable employment disruption and worker displacement in future years.

John Bound and his colleagues focus on the supply of college-educated workers in the US, and how the quantities of college graduates might be affected by declining state appropriations to public colleges and universities—which form the backbone of US higher education. They estimate that declining fiscal appropriations at the state level for public universities cause some categories of these universities to reduce institutional expenditures, enroll fewer students and reduce patenting activity (a sign of declining research productivity), while they also raise tuition and private funding to offset lost public dollars.

As state budgets in the future will continue to feel pressure from rising Medicaid costs and legislature reluctance to increase revenues,, declining fiscal support for public institutions of higher education will likely continue to restrict their ability to produce college graduates and economically valuable research.

Putting together the conclusions of both papers, we see a strong warning against complacency. Without improvements in our public education and workforce development system, the ability of workers to gain more higher education and training in response to rising displacements from automation will likely be sorely tested in the coming years.

B. Labor Institutions and Policies

Other factors in workplace outcomes include the extent of collective bargaining, other "voice" mechanisms, and "high road" employment practices and statutory minimum wage and overtime regulations.

Thomas Kochan and William Kimball's paper analyzes the role of collective bargaining over time in generating not only higher compensation for workers, but also worker "voice" and broader economic benefits in the US in the form of higher productivity. They find that, since about 1980, positive union impacts on worker wages have fallen; and that the type of important partnerships between labor and management that generate high-performance workplaces have become increasingly rare.

Survey evidence suggests that many more workers want representation or other forms of worker "voice" than currently have it. Other attempts to spur "high-road" employment practices, through public financial incentives or technical assistance, can be pursued in nonunion settings but are more difficult to generate and sustain. They conclude that dramatic changes are needed in labor-management legislation and regulations to generate a new "social contract" between workers and their employers that could boost performance and productivity in US workplaces.

Charles Brown and Daniel Hamermesh review the literature on how wage and hour laws – specifically higher minimum wages and overtime pay regulations – affect the employment and earnings of affected workers. They find that, as the federal government has allowed its statutory minimum wage to decline in recent years (relative to median wages in the private and public sectors), many states and localities have raised their own minimum wages, creating much more variation across states than has existed historically.

The federal government has also failed to raise the ceiling on earnings that are covered by overtime rules, so the real earnings ceiling (after allowing for inflation) has diminished over time.[24]

Their review of estimated impacts of minimum wages suggest quite small negative impacts on the employment of young or less-educated workers, though long run effects (as well as those associated with minimum wages at or near $15 an hour) might be considerably larger. And overtime laws seem to reduce hours worked while raising employment and wages. Accordingly, the failure of the federal government to adjust minimum wages and overtime ceilings results in large differences in minimum wages across states that could reduce employment in certain states, while hours worked per employee rise and weekly earnings decline due to diminishing overtime coverage.

These papers together show a need to reexamine the relevance and efficacy of current labor market regulations and employer practices in light of the changing US labor market.

C. Alternative Staffing, Informal Work and "Fissuring"

Another way the labor market is evolving is in the nature of the relationship between employers and workers. Three papers investigate this question from different angles.

Lawrence Katz and Alan Krueger address a recent puzzle about the extent to which independent contracting has risen over time. On the one hand, evidence they generated in a widely cited paper based on the Rand-Princeton Continuous Work Survey, in comparison to earlier estimates, suggested substantial rise in the use of independent contracting among workers over the period 2005-15 (Katz and Krueger 2016). On the other hand, the most recent data from the Bureau of Labor Statistics Contingent Work Survey (CWS) suggested no such increase over time (BLS 2018).

Katz and Krueger analyze a range of hypotheses about why the discrepancy has occurred, and in the end conclude that employment as independent contractors has likely risen by just 1-2 percentage points in this

[24] The Obama Administration attempted to raise the ceiling in its second term, but this action was struck down by the courts.

period, which is considerably lower than the 5 percentage-point increase they had found earlier. This brings their findings closer to those from other sources. Also in line with others, they find discrepancies in measured self-employment activity between CWS and other sources, like data from the Internal Revenue Service (IRS) data and Amazon MTurk. They conclude that alternative staffing arrangements are growing more slowly than they had previously thought, but that casual and part-time, secondary work is likely more important and deserve further study over time.

Apropos of this conclusion, Katharine Abraham and Susan Houseman examine characteristics of the informal jobs. They analyze self-reported data from the Survey of Household and Economic Decision-making (SHED) administered by the Federal Reserve Bank (Board of Governors) in 2015 and 2016. The data reveal that informal work is a frequent activity, with about 28 percent of workers participating in informal work in any given month. Furthermore, significant fractions of workers report that the income generated by such work to be important in their household finances. Yet benefits and legal protections are generally absent in informal work. Workers holding these jobs tend to be in vulnerable situations, including minorities, the less educated, those with lower incomes or experiencing financial stress, those in non-standard work arrangements and the unemployed. The authors conclude that the prevalence and nature of informal work requires developing a better understanding its characteristics in order to design appropriate policies for part-time and nonemployees workers.

Finally, David Weil considers the role of "fissuring" – a term coined in his 2014 book – in today's labor market. Fissuring occurs when employees in the same establishment work for multiple employers, in alternative staffing arrangements (like independent contracting or temping) but also in more regular arrangements, including franchising. As such, the CWS data will not fully capture its prevalence. Other data sources or redesign of the CWS will be needed to track this trend more fully.

Such fissuring practices disrupt many long-standing employment norms within workplaces, such as the historic tendency for large firms or those in high-wage industries to pay all of their workers relatively

higher wages, and the tendency of employers to share product market "rents" with their workers. Employers also have fewer incentives to invest in training such workers.

Thus, fissuring tends to raise earnings inequality and weaken benefit and regulatory coverage. This suggests that further fissuring will lead to even more inequality and lack of legal protection for workers in coming decades. Weil therefore encourages both more research and policy experimentation on issues such as with whom responsibility for labor practices should reside, how pay norms might be established in fissured workplaces, and how benefits and legal protections can be provided as well to these workers.

The three papers together also underline the need for data improvements to guide policy and for a reconsideration of the how employer-employee relationships are defined in regulations that are intended to protect workers.

D. Improving Labor Force Attachment and Outcomes: Women, Blacks, and Disadvantaged Youth

The final three papers consider issues relevant for three particular groups within the labor market.

In their paper, Elizabeth Doran, Ann Bartel and Jane Waldfogel analyze data from the American Time Use Survey (ATUS) and the 1997 cohort of the National Longitudinal Survey of Youth (NLSY97) on male and female access to "family friendly" practices at work such as paid leave, child care and flexible schedules – all of which seem related to higher female labor force participation across industrialized nations. They find that male employees have more access to paid leave overall, though female employees have more access to paid parental leave. Neither men nor women at work have much access to child care, while flexible scheduling is much more available for highly educated workers than for others.

The authors argue that, to increase female labor force participation, we should increase the provision of family friendly policies at work. But these should be funded by a payroll tax mechanism rather than a mandate on employers, because the latter can be more burdensome to particular employers. While also acknowledging the costs of such policies (in taxes or workplace disruption), they argue that public provision of such policies in a number of states has been successful and cost-effective.

William Rodgers' paper considers recent trends in relative labor force participation, employment, and earnings between whites and blacks. Relative earnings rose for blacks until around 1980, while employment and labor force activity declined for black men. Large racial gaps therefore persist in all of these measures.

Rodgers attributes these changes to a wide set of causes, potentially including education and achievement gaps, declining unionism and manufacturing employment, and rising incarceration rates. Accordingly, he argues that no single policy effort will reverse these trends, so he advocates for a range of policies – including several that are "race-neutral" but would disproportionately benefit African-Americans in the labor market.

Pamela Loprest, Demetra Nightingale and Shayne Spaulding examine trends in labor force activity among teens and young adults. Observed declines in such activity overall are mostly attributable to rising school enrollments over time; but substantial rates of low activity and "disconnection" from both school and work still appear among low-income and minority youth. Causes of these trends include poor schooling and lack of early work experience, opioid dependency, incarceration and other barriers to well-paid work.

Loprest et al. therefore argue for education and training policies in secondary school, community colleges, and workplaces to better connect young people with the labor market and improve their work-related skills and experience. Reducing the barriers associated with opioid use and criminal records could be important as well.

All three papers makes the similar point that there are no single policy silver bullets to improve outcomes for these groups. Yet, evidence suggests that a set of policies crafted with reference to data and program evaluations offer promise to improve outcomes for workers in vulnerable situations.

III. Conclusion

Our review of US labor market trends highlights three broad disappointing outcomes in recent decades: modest real wage growth, rising inequality and declining labor force activity among key groups – including women recently but especially African American and young/less-educated men over longer time periods. These trends reflect labor market and institutional forces that are likely to persist throughout coming decades. Thus, the outcomes for workers in the 21st century will hinge critically on whether policy and employer decisions translate these forces into opportunities or more limitations for vulnerable workers. To advance our national conversation about these issues, authors for this volume addressed forward-looking topics in four broad categories: Labor demand and supply factors (such as automation and college attainment), institutional factors (like collective bargaining or minimum wage and hour rules), alternative staffing arrangements (including informal work and "fissured" workplaces) and trends facing particular worker groups (like women, African Americans and disadvantaged youth).

Major findings from these papers emphasize the relentless nature of the forces at play, including:

- Labor market automation will likely accelerate over time, potentially increasing worker dislocation and inequality.
- Declining state subsidies for public higher education (because of ongoing budgetary pressures caused by rising Medicaid costs and legislature refusal to raise revenues) will likely lessen the abilities of workers to obtain new postsecondary credentials in response to changing demands for skill.
- Private collective bargaining has been disappearing, with no alternative "voice" mechanisms taking its place to encourage high-performance workplace practices.
- Federal minimum wage levels and restrictions on overtime hours are not being updated, leading to greater variation across states and localities as well as overall lower wages and employment.
- Alternative staffing arrangements like online work and independent contracting are growing quite modestly, while informal work and "fissuring" of workplaces become more important –

potentially increasing workplace inequality and diminishing benefit coverage and legal protections for workers.

- Female (and often male) employees have limited access to "family friendly" policies at work, such as paid leave, child care, and flexible scheduling that might raise female labor force activity.
- Declining or low labor force activity among African Americans and disadvantaged youth reflect many ongoing factors, including education and achievement gaps, little access to early employment and training, and the negative effects of incarceration and opioid dependency.

The authors also point to policies, within the broad set described earlier, that could help translate the forces at play into improved employment outcomes for US workers in the coming years. These include:

- Workforce development policies that enable workers to better adapt to workplace automation (perhaps including lifelong learning accounts, subsidized on-the-job training, and robust workforce services);
- More financial support for public higher education at the state and federal levels;
- Updating federal wage and hour laws;
- Stronger federal protections for collective bargaining or alternative mechanisms of worker "voice," as well as rewards and technical assistance for employers creating "high-road" jobs and high-performance workplaces;
- Portable benefits and expanded protections for workers in alternative staffing, informal and fissured work situations;
- Family-friendly workplaces and payroll tax-supported programs that cost-effectively provide paid parental leave, child care subsidies and, encourage flexible scheduling; and
- Better employment and training options for disadvantaged youth and adults, along with efforts to reduce negative effects of criminal records and opioid dependency.

In addition, we note a major recommendation that implicitly underlies this volume. Policy must support a comprehensive ability to monitor and analyze labor market developments via gold standard official statistics, administrative data and program evaluations. Such support includes adequate funding of statistical agencies, expanded safe access to administrative data and sponsorship of policy experiments and evaluations. Regardless of how conditions and policies evolve, our ability to monitor key trends and evaluate policy experiments will greatly affect whether we can generate effective labor market policies and desired outcomes for US workers. For the best chance of success, decisions should be based on solid evidence, at many levels of aggregation, to inform policy makers, program administrators, workers, and employers, and allow further research into causes and consequences.

We hope that as this volume sheds light on critical labor market forces now affecting the lives of many millions of Americans (especially among non-college educated workers whose fortunes have badly lagged in recent years), it will stimulate discussion, careful analysis and policy actions to address the challenges in store for us all during the 21st century.

References

Abowd, John and Francis Kramarz. 1999. "The Analysis of Labor Markets Using Matched Employer-Employee Data." In O. Ashenfelter and D. Card eds. *The Handbook of Labor Economics*, Vol. 3c. North Holland.

Abraham, Katharine and Melissa Kearney. 2018. "Explaining the Decline in the U.S. Employment-to-Population Ratio: A Review of the Evidence." NBER Working Paper.

Acemoglu, Daron and Pascual Restrepo. 2018. "AI, Automation and Work." NBER Working Paper.

Andersson, Fredrik; Harry Holzer and Julia Lane. 2011. *Where Are All the Good Jobs Going?* New York: Russell Sage Foundation.

Andersson, Fredrik, Harry Holzer, Julia Lane, David Rosenblum and Jeffrey Smith. 2013. "Does Federally Funded Job Training Work? Nonexperimental Estimates of WIA Training Impacts Using Longitudinal Data on Firms and Workers." NBER Working Paper No. 19446.

Austin, Benjamin, Edward Glaeser and Lawrence Summers. 2018. *Saving the Heartland: Place-Based Policies in 21st Century America*. Policy Brief, Economic Studies, Brookings Institution, Washington DC.

Autor, David. 2018. *Is Automation Labor-Displacing? Productivity, Employment and Labor's Share*. Brookings Brief, Economic Studies.

Autor, David. 2014a. "Skills, Education and the Rise of Earnings Inequality among the 99 Percent." *Science*, Vol. 344, Issue 6186.

Autor, David. 2014b. "Polanyi's Paradox and the Shape of Employment Growth." NBER Working Paper No. 20485.

Autor, David. 2015. "Why are There Still So Many Jobs?" *Journal of Economic Perspectives*.

Autor, David, David Dorn and Gordon Hanson 2013. "China Syndrome: Local Labor Market Effects of Import Competition in the US." *American Economic Review.* October. 103(6), 2121-68.

Autor, David, David Dorn, Lawrence Katz, Christina Patterson and John Van Reenen. 2018. "Concentrating on the Fall of the Labor Share." NBER Working Paper No. 23108.

Autor, David and Mark Duggan. 2006. "The Growth of the Social Security Disability Rolls: A Fiscal Crisis Unfolding." NBER Working Paper.

Autor, David and Lawrence Katz. 1999. "Changes in the Wage Structure and Earnings Inequality." In O. Ashenfelter and D. Card eds. *Handbook of Labor Economics, Vol. 3A*. Amsterdam: North Holland.

Autor, David, Lawrence Katz and Melissa Kearney. 2008. "Trends in US Wage Inequality: Revising the Revisionists." *Review of Economics and Statistics.*90 (2), 300-323.

Autor, David, Frank Levy and Richard Murnane. 2002. "Upstairs, Downstairs: Computers and Skills on Two Floors of a Large Bank." *Industrial and Labor Relations Review* 55 (3), 432-447.

Autor, David and Melanie Wasserman, 2013. *Wayward Sons: The Emerging Gender Gap in Labor Markets and Education*. The Third Way, Washington DC.

Baily, Martin and Nicholas Montalbano. 2016. *Why is US Productivity Growth So Slow? Possible Explanations and Policy Responses*. Policy Brief, Economic Studies, The Brookings Institution, Washington DC.

Beaudry, Paul; David Green and Benjamin Sand. 2013. "The Great Reversal in the Demand for Skills and Cognitive Tasks." NBER Working Paper No. 18901.

Bernstein, Jared. 2018. *The Importance of Strong Labor Demand*. Hamilton Project, Brookings Institution, Washington DC.

Black, Sandra, Diane Whitmore Schanzenbach and Audrey Breitwieser. 2017. *The Recent Decline in Women's Labor Force Participation*. The Hamilton Project, Brookings Institution, Washington DC.

Blanchard, Olivier and Lawrence Katz. 1992. "Regional Evolutions." *Brookings Paper on Economic Activity*, 1992 (1).

Blasi, Joseph, Richard Freeman and Douglas Kruse. 2014. *The Citizen's Share*. New Haven: Yale University Press.

Bound, John and Harry Holzer. 2000. "Demand Shifts, Population Adjustments and Labor Market Outcomes in the 1980s."' *Journal of Labor Economics.*

Bureau of Labor Statistics, 2018. *Contingent and Alternative Work Arrangements*. News Release, June 7.

Burtless, Gary and Sveta Milusheva. 2013. Effects of Employer-Sponsored Health Insurance Costs on Social Security Taxable Wages.*Social Security Bulletin* 73(1): 83-108

Card, David and Jonathan Dinardo. 2008. "The Impact of Technological Change on Low-Wage Labor Markets: A Review." In R. Blank et al. eds. *Working and Poor: How Economic and Policy Changes are Affecting Low-Wage Workers*. New York: Russell Sage Foundation.

Davis, Steven and Till von Wachter. 2011. "Recessions and the Costs of Job Loss." *Brookings Papers on Economic Activity*, no. 2. https://www.brookings.edu/bpea-articles/recessions-and-the-costs-of-job-loss/

Doar, Robert et al. 2017. *Getting Men Back to Work: Solutions from the Left and Right*. Washington DC: American Enterprise Institute.

Farber, Henry. 2017. "Employment, Hours, and Earnings Consequences of Job Loss: U.S. Evidence from the Displaced Workers Survey," *Journal of Labor Economics*, 35(S1) S235-S272.

Fitzpayne, Alastair and Ethan Pollack. 2017. *A Changing Economy Requires a Renewed Focus on Lifelong Learning*. Washington DC: The Aspen Institute.

Fortin, Nicole; Thomas Lemieux and Neil Lloyd. 2018. "Labor Market Institutions ad the Distribution of Wages: The Role of Spillover Effects. Working Paper, Vancouver School of Economics, University of British Columbia.

Freeman, Richard. 2007. "Is a Great Labor Shortage Coming? Replacement Demand in the Global Economy." In H. Holzer and D. Nightingale eds. *Reshaping the American Workforce in a Changing Economy.* Washington DC: Urban Institute Press.

Freeman, Richard; Joni Hersch and Lawrence Mishel eds. 2004. *Emerging Labor Market Institutions for the 21st Century*. Chicago: University of Chicago Press.

Frey, William. 2015. *Diversity Explosion*. Washington DC: Brookings Press.

Goldin, Claudia and Lawrence Katz. 2008. *The Race between Education and Technology*. Cambridge MA: Harvard University Press.

Gould, Elise. 2019. "Decades of Rising Inequality in the US." Testimony before US House of Representatives, Committee on Ways and Means.' March 19.

Groshen, Erica et al. 2018. "Preparing U.S. Workers and Employers for an Autonomous Vehicle Future," Securing America's Future Energy. Washington, DC.

Harris, Seth and Alan Krueger. 2015. *A Proposal for Modernizing Labor Laws for the 21st Century: The "Independent Worker.*" The Hamilton Project, Brookings Institution, Washington DC.

Helper, Susan et al. 2017. "Value and Migration 4.0: Theory, Field Evidence and Propositions." Unpublished manuscript, Case Western Reserve University.

Holzer, Harry. 2015. *Job Market Polarization and Worker Skills: A Tale of Two Middles*. Policy Brief. Brookings Institution, Washington DC.

Holzer, Harry and Marek Hlavac. 2014. “A Very Uneven Road: US Labor Markets in the Past 30 Years.” In John Logan ed. *Diversity and Disparities*. New York: Russell Sage Foundation.

Holzer, Harry, Richard Block, Marcus Cheatem, and Jack Knott. 1993. “Are Training Subsidies for Firms Effective? The Michigan Experience.” *Industrial and Labor Relations Review*. 46 (4), 624-36.

Judy, Richard and Carol D’Amico. *Workforce 2020: Work and Workers in the 21st Century*. Indianapolis IN: Hudson Institute.

Katz, Lawrence and Alan Krueger. 2016. “The Rise and Nature of Alternative Work Arrangements in the United States, 1995-2015.” NBER Working Paper.

Kelley, Maryellen and Susan Helper. 1999. “Firm Size and Capabilities, Regional Agglomeration, and the Adoption of New Technology,” Economics of Innovation and New Technology 8, no. 1-2 (1999): 79-103. https://pdfs.semanticscholar.org/3d40/ebf41076da32747f48d4fbbcd078ffc04b60.pdf

Krueger, Alan. 2017. “Where Have All the Workers Gone?” *Brookings Papers on Economic Activity*. 2017 (1).

Kugler, Adriana. 2015. *Strengthening Reemployment in the Unemployment Insurance System.* The Hamilton Project, Brookings Institution, Washington DC.

Levy, Frank. 2018. “Computers and Populism: Artificial Intelligence, Jobs and Politics.” *Oxford Review of Economic Policy*, 34:393-417.

Levy, Frank and Richard Murnane. 2013. *Dancing With Robots*: Washington DC: The Third Way.

Liebman, Jeffrey. 2015. “Understanding the Increase in Disability Insurance Benefit Receipt in the United States.” *Journal of Economic Perspectives,* 29: (2), 123-50.

Maguire, Sheila, Joshua Freely, Carol Clymer, Maureen Conway and Deena Schwartz. 2010. *Tuning Into Local Labor Markets*. Philadelphia:PPV.

Mandel, Michael. 2017. *How Ecommerce Reduces Inequality and Creates Jobs*. Washington DC: Progressive Policy Institute.

Mishel, Lawrence; John Schmitt and Heidi Shierholz. 2013. *Don’t Blame the Robots: Assessing the Job Polarization Explanation of Growing Wage Inequality*. Economic Policy Institute, Washington DC.

Neal, Derek. 2008. “Black-White Labor Market Inequality in the United States.” In S. Durlauf and L. Blume eds. *The New Palgrave Dictionary of Economic*s. New York: Stockton Press.

Nedelkoska, Ljubica and Glenda Quintini.2018. “Automation, Skills Use and Training.” OECD Social, Employment and Migration Working Papers No. 202.

Organization of Economic Cooperation and Development (OECD), 2011. *An Overview of Growing Income Inequalities in OECD Countries: Main Findings*.

Osterman, Paul. 2017. “In Search of the High Road: Meaning and Evidence.” *Industrial and Labor Relations Review*. 71 (1).

Pellegrino, James and Margaret Hilton. 2012. *Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century*. Washington DC: National Academies Press.

Pierce, Brooks. 2001. “Compensation Inequality.” *Quarterly Journal of Economics*. Vol. 116, No. 4..

Shambaugh, Jay et al. 2017. “13 Facts about Wage Growth.” Hamilton Project, Brookings Institution, Washington DC.

Shambaugh, Jay et al. 2018. *The State of Competition and Dynamism: Facts about Concentration, Startups and Related Policies*. Brookings Brief, Hamilton Project.

Shimada, Haruo and John Paul MacDuffie. 1998. “Industrial Relations and ‘Humanware’: Japanese Investments in Automobile Manufacturing in the United States,” in Schon Beechler (ed.), *The Japanese Enterprise*. London: Routledge.

Stansbury, Anna and Lawrence Summers. 2017. “Productivity and Pay: Is the Link Broken?” NBER Working Paper No. 24165.

Ton, Zeynep. 2014. *The Good Jobs Strategy*. Cambridge MA: MIT Press.

Trilling, Bernie and Charles Fadel. 2009. *21st Century Skills: Learning for Life in Our Times*. San Francisco: Jossey-Bass.

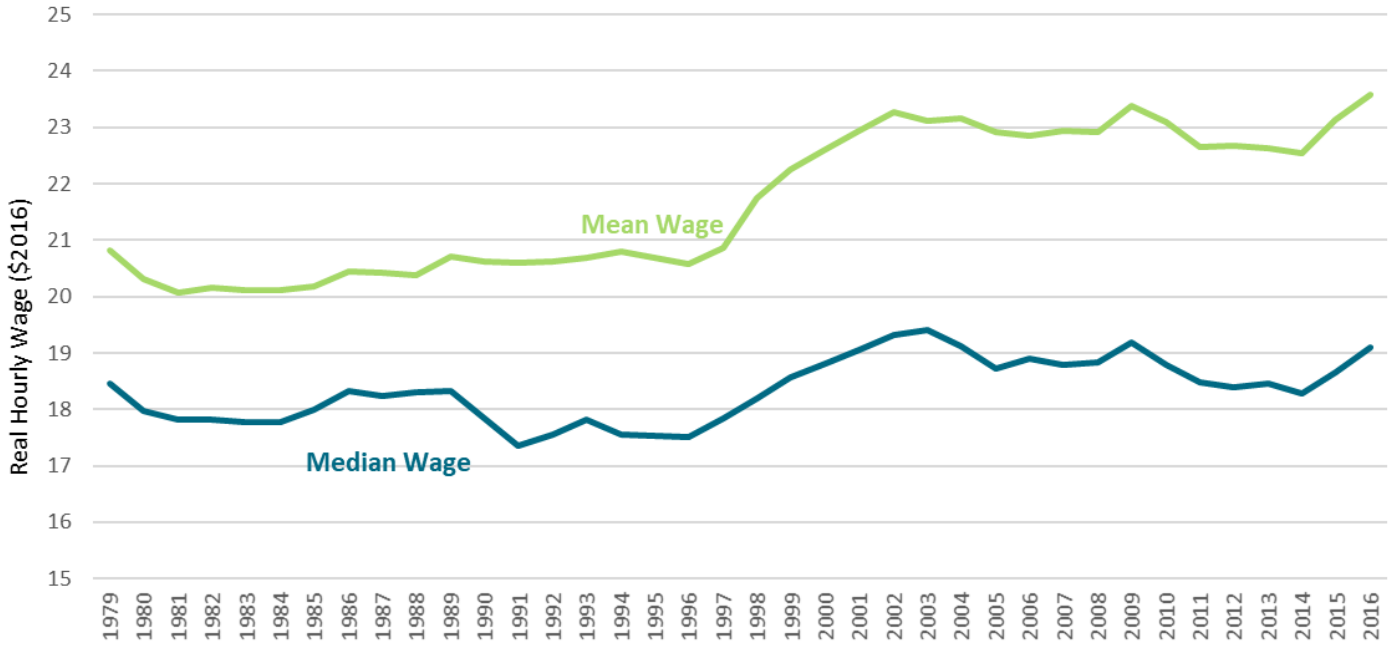
US Census Bureau, 2012. “Census Bureau Releases Estimates of Undercount and Overcount in the 2010 Census.” Newsroom Release, May 22.

Van Horn, Carl et al. eds. 2015. *Transforming the Workforce Development System for the 21st Century.* Kalamazoo MI: W.E. Upjohn Institute for Employment Research.

Weil, David. 2014. *The Fissured Workplace*. Cambridge MA: Harvard University Press.

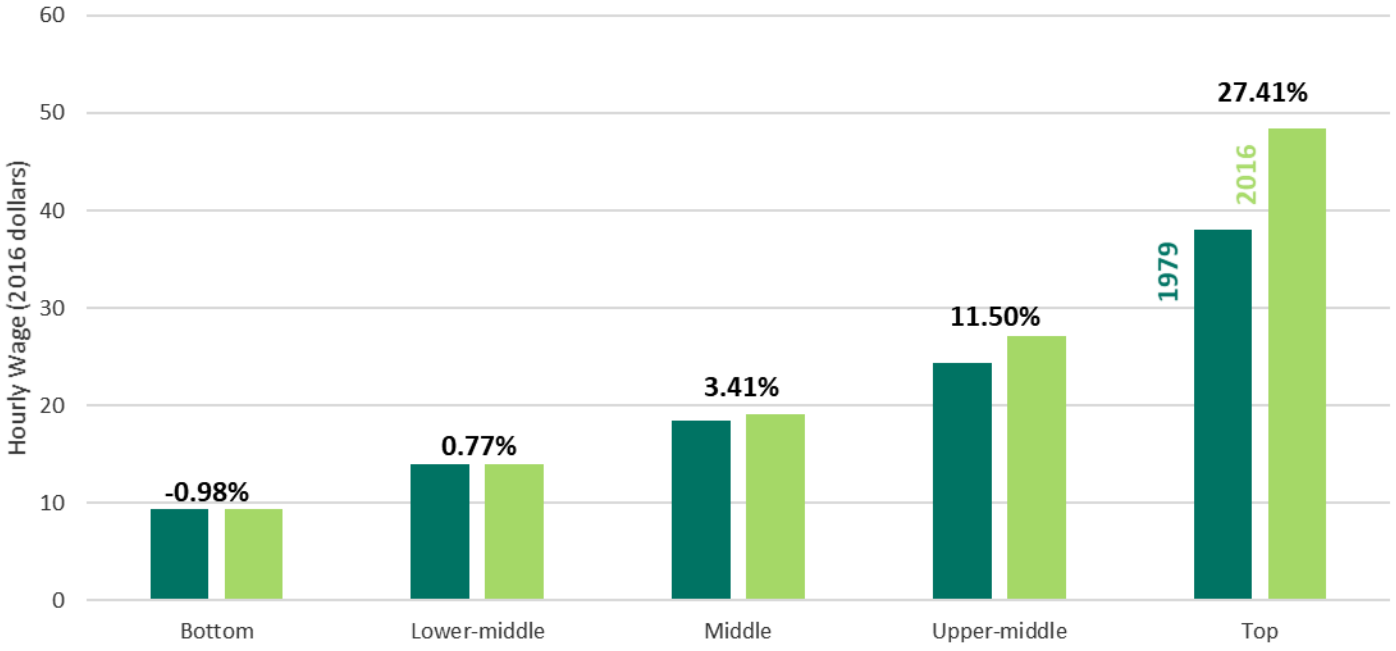
West, Darrell. 2018. *The Future of Work: Robots, AI and Automation*. Washington DC: Brookings Press

Figure 1: Mean and Median Wages, 1979-2016



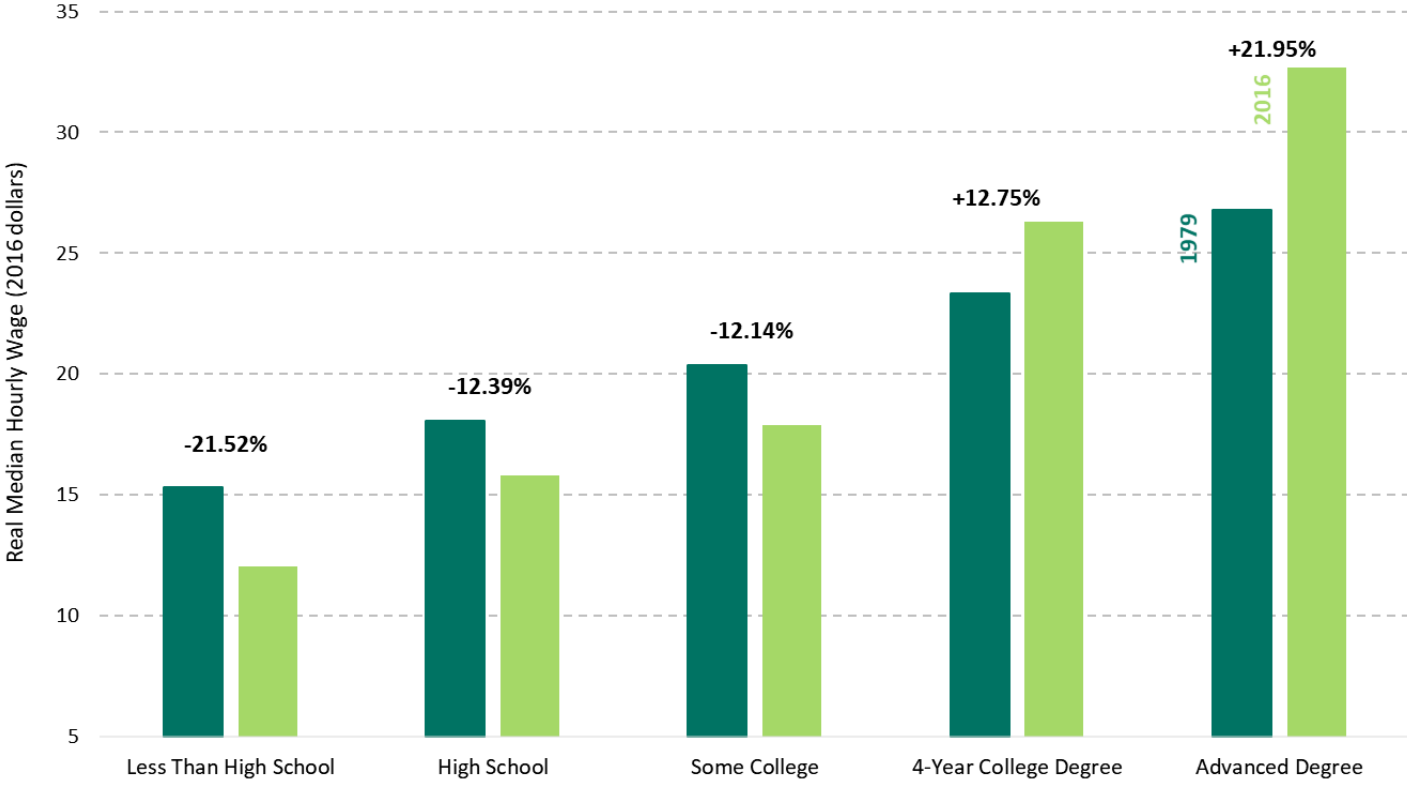
Source: Current Population Survey, Bureau of Labor Statistics 1979–2016; authors' calculations.
Note: Wages are deflated using the CPI-U-RS.
Sample includes workers aged 25 to 54 years.

Figure 2: Real Wage Levels and Growth by Wage Quintile, 1979-2016"



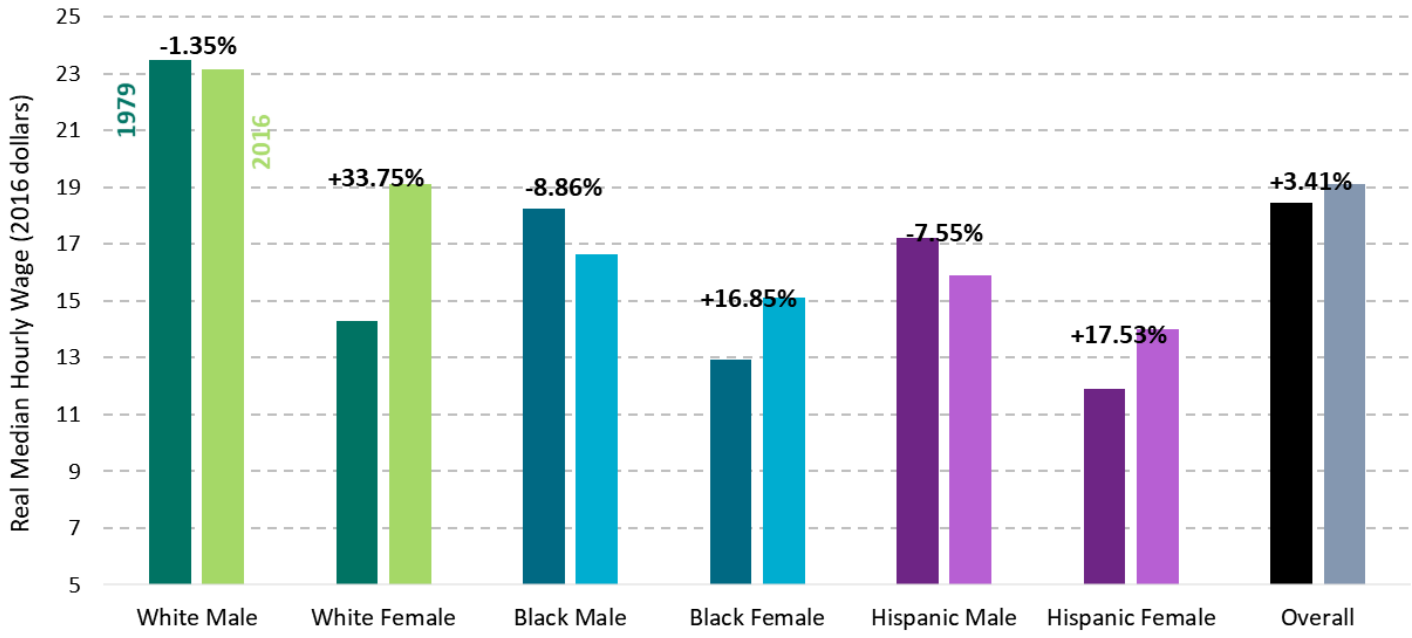
Source: Current Population Survey, Bureau of Labor Statistics 1979–2016; authors' calculations.
Note: Wages are deflated using the CPI-U-RS.
Sample includes workers aged 25 to 54 years.

Figure 3: Real Wage Levels and Growth by Educational Attainment



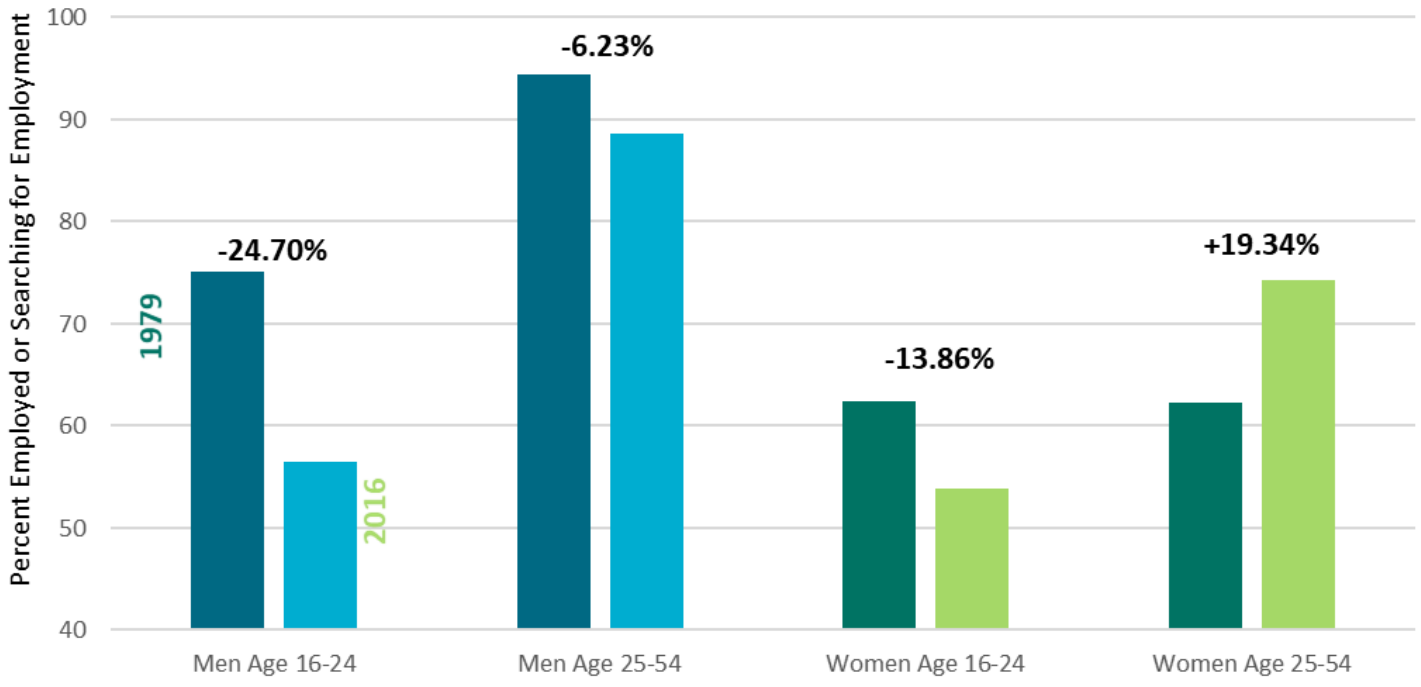
Source: Current Population Survey, Bureau of Labor Statistics 1979 and 2016; authors' calculations.
Note: Wages are median hourly earnings and deflated using the CPI-U-RS.
Sample includes those aged 25-54 years.

Figure 4: Real Wage Levels and Growth by Race and Gender



Source: Current Population Survey, Bureau of Labor Statistics 1979-2016; authors' calculations.
Note: Wages are median hourly earnings and deflated using the CPI-U-RS.
Sample includes those aged 25-54 years.

Figure 5: Changes in Labor Force Participation Rates: 1979 to 2016



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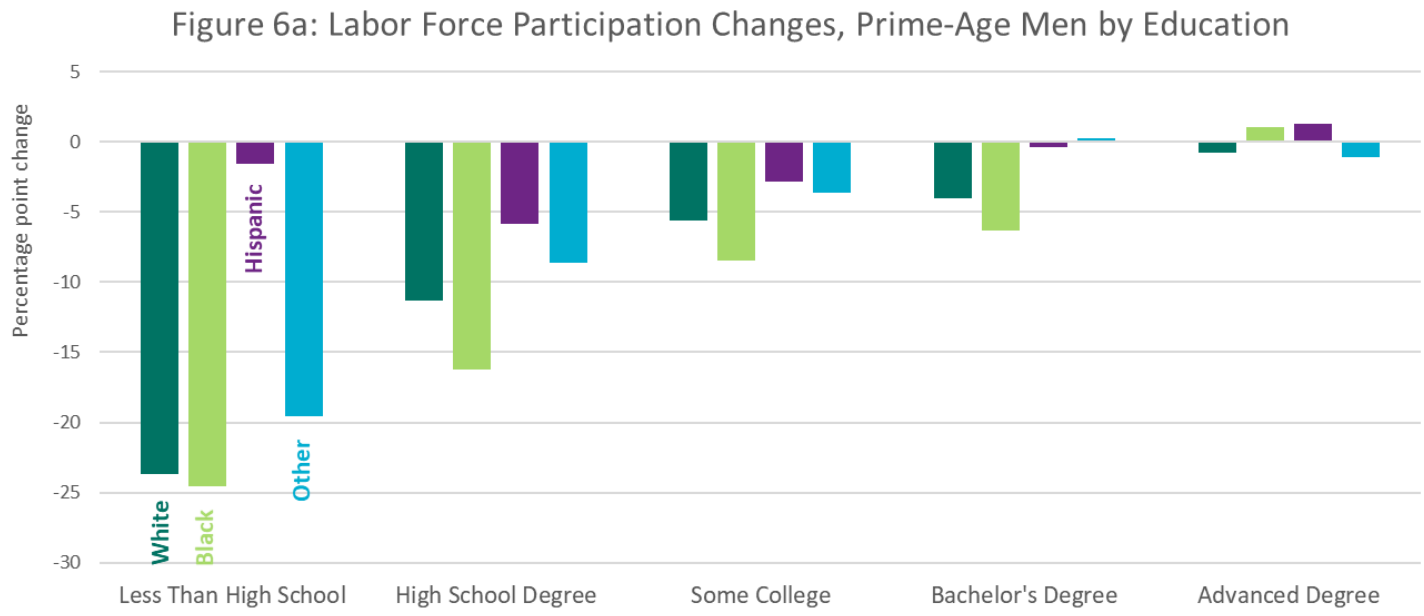
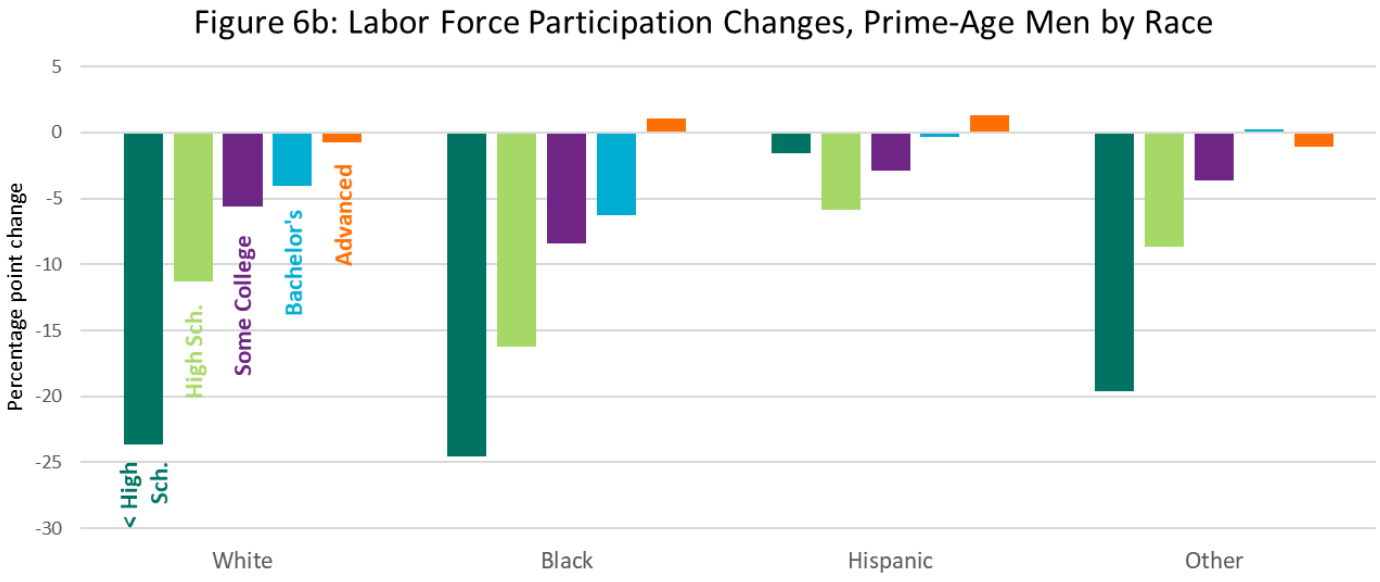


Source: Current Population Survey, Bureau of Labor Statistics 1979-2016; authors' calculations.
Note: Sample includes men aged 25-54 years.



Source: Current Population Survey, Bureau of Labor Statistics 1979-2016; authors' calculations.
Note: Sample includes men aged 25-54 years.