Is the Middle of the U.S. Job Market Really Disappearing?

A Comment on the “Polarization” Hypothesis

Harry J. Holzer    May 11, 2010

Massachusetts Institute of Technology economist David Autor describes an ongoing polarization in the U.S. labor market, with “expanding job opportunity in both high-skill, high-wage occupations and low-skill, low-wage occupations, coupled with contracting opportunities in middle-wage, middle-skill white-collar and blue-collar jobs.”¹ In his recent paper for the Center for American Progress and The Hamilton Project at the Brookings Institution, Autor implies that middle-skill jobs today mostly require the performance of routine manual or clerical tasks for which demand is being replaced by new technology and global forces while nonroutine tasks appear either in high-skill jobs requiring a four-year college degree or higher or low-wage service jobs requiring no postsecondary skills.

In contrast, a few recent papers I have written with Urban Institute economist Robert Lerman suggest that employment in many middle-skill job categories remains robust, with growing demand and opportunities for noncollege graduates in some areas.²

Which view is more accurate? Indeed, do they reflect substantively different views of the labor market, or mostly differences in how jobs are defined and categorized? And what do these views suggest about education and workforce policies for the United States?

Below I summarize both sets of arguments and the data on which they are based. Autor is absolutely correct that there has been some shrinkage in middle-skill jobs requiring only the performance of routine tasks, especially production jobs for equipment operators and laborers and office jobs for clerical workers. But other categories of middle-skill jobs, which involve the performance of many nonroutine tasks and often require some postsecondary education or training—among them technician jobs and many service jobs in health care—are not shrinking to any real extent. It is important to acknowledge major employment opportunities for noncollege graduates in these latter categories of middle-skill jobs.
In sum, the notion that we are developing an “hourglass economy” with large top and bottom layers but a vastly shrinking middle, while not without basis, has been overblown. Accordingly, there remains a strong need for more workers with better cognitive and analytical skills and with four-year college degrees, as Autor emphasizes. But the kinds of postsecondary education and training below the level of a four-year bachelor’s degree that still provide satisfactory preparation for many well-paying middle-skill jobs should be supported as well. And other policies to encourage higher job quality, as well as opportunities for workers to develop skills and progress on the job within a range of sectors, can be helpful too.

Definitions and measurement

How are “middle-skill” jobs defined in each paper? And what results are presented that demonstrate their alleged growth or shrinkage?

Autor categorizes jobs by occupational category. In some cases, he uses the average (or median) wage in detailed occupational categories in 1980 to array them from highest to lowest skill. In other cases, he develops broad occupational categories and looks at wage and employment trends in each, sometimes separately for workers of different education levels. And he relies on earlier work with a range of co-authors to argue that jobs mostly requiring routine tasks are disappearing while those requiring nonroutine task performance are growing both at the high-paying professional or managerial ends of the job market and at the low-paying service ends of the labor market.

Lerman and I define middle-skill jobs as those that generally require education or training beyond high school but less than a four-year bachelor’s degree. We, too, present data for broad occupational categories, including wage and employment growth over the period 1986 to 2006 as well as occupational projections from the Bureau of Labor Statistics for the coming decade. We also present data on detailed jobs in these categories to give some sense of the range of outcomes around the averages. We consider projections on the likely trends in educational attainment over the next decade, as well as industry- and region-specific descriptive reports on labor market tightness and short-term worker shortages as well.

What do the results of each analysis show? Autor’s data (and our own) certainly show some shrinkage during the past two decades in both employment and wage growth in Autor’s middle-wage job categories, relative to other groups. But whether occupational wages in 1980 are the right way to categorize skill levels of jobs today can be debated; I have seen no evidence that middle-skill job categories mostly involve tasks that are routine in nature. Putting aside those concerns for now, a close examination of his data reveals some results that do not fit very clearly within the “polarization” story.
For instance, Autor’s data show strong inconsistencies across specific time periods in relative wage and employment growth at the top, middle, and bottom parts of the wage spectrum over the past 30 years. During the 1980s, both employment and wage growth at the bottom of the wage spectrum lagged behind the middle and especially the top. During the 1990s, employment growth overall was robust, but in both the bottom and the middle it was fairly modest relative to the strong growth of jobs at the top of the spectrum. And in the 2000s, employment in the bottom-paying jobs grew most rapidly while the highest-paying jobs grew no faster than those in the middle (see Figure 1).

Moreover, real wage growth between 1988 and 2006 was quite modest for all groups except for the very top few deciles of earners (see Figure 2). Thus, while the occupations at the middle of the wage distribution have lagged somewhat in wage and employment growth since 1989, no consistent “polarization” story emerges at any time during this entire period.

Source: Data are Census IPUMS 5 percent samples for years 1980, 1990, and 2000, and U.S. Census American Community Survey 2008. All occupation and earnings measures in these samples refer to prior year’s employment. The figure plots log changes in employment shares by 1980 occupational skill percentile rank using a locally weighted smoothing regression (bandwidth 0.8 with 100 observations), where skill percentiles are measured as the employment-weighted percentile rank of an occupation’s mean log wage in the Census IPUMS 1980 5 percent extract. Mean education in each occupation is calculated using workers’ hours of annual labor supply times the Census sampling weight. Consistent occupation codes for Census years 1980, 1990, and 2000, and 2008 are from Autor and Dorn (2009a).

May/ORG CPS data for earnings years 1973-2009. Each year comprises a three-year moving average (e.g. 1974 contains May/ORG data from 1973, 1974, and 1975), with years equally weighted. The real log hourly wage is computed by year for each percentile between the 5th and 95th percentiles. In every year, real log hourly wages are adjusted such that they equal zero at the respective year’s median (50th percentile). The percent change represents the difference in the log wages values (relative to the median) at each percentile between the relevant years.
Indeed, Autor’s own results later in the paper—when real earnings growth over time is presented for workers with different levels of education—show quite substantial (and increasing) wage returns to each additional year of education above grade 12, even for workers who finish one to three years of college but do not go on to obtain a bachelor’s degree (see Figure 3). In fact, the “polarization” hypothesis would imply that, all else being equal, returns to schooling in these years should be flattening (relative to those in grades 12 and below) while for those with four or more years of college they should be sharply accelerating. Autor’s data, however, show a more linear pattern of increasing returns for each year.

In addition, earnings for women with some college education but no bachelor’s degree grew quite handsomely over the past three decades, as Autor also demonstrates (see Figure 4). And any negative results over this period for men with some college would likely disappear if we were better able to measure inflation correctly.6

Of course, men and women with bachelor’s degrees or higher fared even better over this same period, but the potential for those who can manage to get only some postsecondary training short of the bachelor’s level is very noteworthy in Autor’s own results.

Yet Autor’s results based on broad occupational categories come to more pessimistic conclusions. His results suggest employment shrinkage over time in several middle-skill occupational categories, including sales and “production, craft, and repair” as well as machine
operators and office/administrative workers. Problem is, Autor treats the “technicians” and “protective service” occupational categories—where employment growth has been quite substantial in each case—as high skill and low skill, respectively, even though Bureau of Labor Statistics data indicate that most jobs in both categories require some postsecondary education below a bachelor’s degree and pay relatively well. And his lumping together of “production” with “craft and repair” obscures the fact that the latter category (now known as “installation, maintenance, and repair” jobs) has seen fairly steady employment growth along with relatively high wages over the past two decades and is projected to continue doing so by BLS.

Thus, the uniformly negative views of employment and earnings trends in middle-skill jobs that Autor finds are fairly sensitive to exactly how jobs are categorized. And an exclusive reliance on percent employment growth over time without regards to employment levels also reinforces that negative impression.

In my work with Lerman, we find that the middle-skill occupations shrank from a bit more than half of the workforce (55 percent) in 1986 to just under half (48 percent) in 2006, with production-transportation and clerical jobs accounting for virtually the entire decline.

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**FIGURE 4**

**Percent changes in real hourly earnings by education, 1979–2007**

<table>
<thead>
<tr>
<th></th>
<th>High school dropout</th>
<th>High school graduate</th>
<th>Some college</th>
<th>College graduate</th>
<th>Postcollege education</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Males</strong></td>
<td>-0.16</td>
<td>-0.12</td>
<td>-0.04</td>
<td>0.10</td>
<td>0.26</td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td>-0.01</td>
<td>0.06</td>
<td>0.12</td>
<td>0.29</td>
<td>0.37</td>
</tr>
</tbody>
</table>

Source: Map/IRG CPS data for earnings years 1973-2009. The data are sorted into sex-race-age-education groups of two sexes (male/female), three race categories (white, black, nonwhite other), four age groups (16-24, 25-39, 40-54, 55-64), and five education groups (high school dropout, high school graduate, some college, college graduate, and greater than college). The mean log wage for each gender-education group presented in the figure is the weighted average of the relevant cells using a fixed set of weights equal to the average employment share of each group. The percent change is calculated using exponentiated mean log wages for 1979 and 2007.
Indeed, the sales and installation-repair categories, as well as the “technician” jobs buried within the “professional and related” category, either maintained their shares of the workforce or grew in this period. In construction, employment maintained most of its share of all jobs, even before the housing “bubble” of the mid-2000s and certainly grew afterwards.

And, by most definitions we use, the broad middle-skill occupations will continue to account for 40 percent to 45 percent or more of all hiring over the current decade. Stories of dramatic polarization, along with “hourglass” or “dumbbell” metaphors used in popular interpretations of this work, seem inconsistent with these facts.

Some other findings in our work reinforce the notion that some parts of the middle-skill job market will remain robust over the coming years. For instance, average earnings growth in broad occupational categories clearly obscures a wide range of growth rates in more specific occupations in each group. Lerman and I emphasize that both employment and earnings growth over the past 20 years have been very substantial in certain large but more detailed occupational categories of middle-skill jobs. These include technicians, licensed practical nurses, and therapists in health care, as well as a range of technicians and craft workers in construction and elsewhere. And BLS projects similar employment growth in the decade beyond in most of these categories.

Lerman and I also note that labor-market trends in future years will depend both on the growth of labor demand and labor supply in these various skill categories. Projections by economist David Ellwood for the Aspen Institute suggest a dramatic slowdown in labor supply growth at the top and especially the middle of the skills distribution as Baby Boomers retire and are replaced by immigrants. Indeed, our view that “replacement demand” will likely contribute to labor-market tightness in middle-skill jobs is based on these projections, and not on the occupations in which these retirees are currently found, as Autor suggests in endnote 20 of his paper. Our projections and those by Ellwood may prove inaccurate if retirements are greatly postponed or immigrant education improves, but these projections certainly imply a plausible scenario in which middle-skill job markets will tighten.

Finally, we include references to many state- and industry-specific reports of high job vacancy rates and hiring difficulties by employers in a range of middle-skill occupations. Among them are all kinds of nursing positions and those for machinists. While these reports generally precede the current economic downturn, Louis Uchitelle of The New York Times reports difficulties identifying qualified applicants even among employers seeking to hire in the traditional blue-collar occupation of welders in the past year or so.

Conclusion and implications for policy

In the end, I share Autor’s conclusion that there has been some shrinkage in middle-wage and middle-skill jobs over time, especially in jobs requiring the performance of routine production or clerical tasks. But many important middle-skill jobs involve nonroutine
tasks and require some postsecondary education and training short of a bachelor’s degree. These jobs are not shrinking in the labor market, and will offer substantial opportunities for earnings improvements to many youth and adults for whom a bachelor’s degree might be out of reach.

We certainly can and should try to improve cognitive skill attainment and four-year college attendance and completion in the United States. But an exclusive focus on “college prep” curricula and bachelor’s degree attainment for all would be a mistake, in my view. Currently, roughly a fourth of our youth still do not finish high school. Perhaps another fourth (or a third of all high school graduates) obtain little or no postsecondary education, while dropout rates without the completion of any certificate or degree are simply enormous for those who do enroll.

Under these circumstances, improving the rates at which young people and adults attain the many kinds of postsecondary certifications that the labor market rewards would constitute an enormous improvement over current circumstances. Given these findings, hoping for the perfect should indeed not become the enemy of the good.

We are developing some better understanding of the causes of poor postsecondary completion rates—even when incentives are so positive—and generating evidence of appropriate policy remedies, such as performance-based financial aid and supports for community college students as well as “sectoral” training for low-income adults. We also have rigorous evidence of strong returns to high-quality career and technical education at the secondary and postsecondary levels, and to some kinds of technical training at community colleges for disadvantaged youth and displaced adults. Given the apparently high variance in returns to such postsecondary education and training across fields, it seems appropriate to target job training to areas where we have some evidence of strong ongoing demand, as the “sectoral” programs have clearly done.

Finally, there are additional policies that can directly target the demand-side of the labor market, and generate improvements in the quality of jobs within the sectors we describe here, as well as in the workers to fill them. Of course, higher levels of minimum wages and more prevalent collective bargaining can play such a role, at least to some extent.

But tax incentives and technical assistance, as part of both economic development and related job-training policies, can also be used to bolster the rates at which employers provide training and advancement opportunities to their workers in “high-road” establishments, for instance as the Center on Wisconsin Strategy does through the Wisconsin Regional Training Partnership or as California does with its Employment Training Panel for incumbent workers. Experimentation with and evaluation of such programs and policies should proceed as well.
References


Endnotes

1 DavidAutor, “The Polarization of Job Opportunities in the U.S. Labor Market (Washington: Center for American Progress and Hamilton Project, 2010).


6 Figure 4 shows real wage growth of -0.4 and .32 respectively for males and females with some college between 1979 and 2007. Regarding inflation, Autor uses the personal consumption expenditure component of the Gross Domestic Product (GDP) Deflator to adjust for inflation over time; this method of adjustment is probably the most accurate we have, but it likely still overstates inflation a bit (though by less than does the Consumer Price Index). This, in turn, implies an understatement of real wage growth by several percent points for both groups over these 28 years.


9 Specifically, the shares of all employment accounted clerical jobs fell by 3 percent points (16.4 to 13.5 percent), production occupations by nearly 3 points (9.1 to 6.5 percent) and transportation/material moving by 1 point (7.2 to 6.1 percent).

10 Technicians are included among “professional and related jobs” in these data, and other sectors as well as skills, to some extent. See Alan Krueger and Lawrence Summers, “Reflections on the Interindustry Wage Structure,” in K. Lang and J. Leonard, eds., Unemployment and the Structure of Labor Markets (New York: Basil Blackwell, 1987). Regarding the extent to which middle-skill jobs require nonroutine tasks, Autor and Dorn (2009) split the nonroutine jobs into high-skill and low-skill categories without considering a middle-skill category or the extent to which middle-skill jobs overall are distributed between the routine and nonroutine jobs.


12 Using broad (1-digit) occupational categories, we report BLS projections through 2044 in which middle-skill occupations will account for 45 percent of all new hiring. Using BLS education and training requirements, and considering all occupations that require more training but less than a bachelor’s degree as middle skill, we report projections in which these jobs will account for about 40 percent of all hiring between 2004 and 2014. Projections that now cover 2008-18 are qualitatively similar to those we report for the 2004-14 period in our 2007 paper.

13 See Table 5 of Holzer and Lerman (2007) for a wide range of large middle-skill occupations in computer support, health care, construction, installation and repair, transportation and services (including chefs, claims adjusters, legal secretaries and paralegals) that are projected to show significant growth over the next decade.

14 See the Aspen Institute, Grow Faster Together or Grow Slowly Apart: How will America Work in the 21st Century? (Boulder CO: Domestic Strategy Group, 2003). The growth rate of college graduates in the labor force is projected to slow from 8.6 percent during 1980-2000 to 3.4 percent during 2000-2020; the comparable rates of actual and expected growth for those with some college are 10.5 percent and 0.7 percent.

15 In that endnote, Autor writes, “A recent study by Holzer and Lerman (2009) observes that middle-skill jobs are disproportionately occupied by workers who are relatively close to retirement. The study concludes that this fact augurs auspicious news about coming job opportunities in these occupations since pending retirements will lead to replacement hiring. A contemporaneous study by Autor and Dorn (2009) offers a different perspective on these same facts. These authors observe that the disproportionate representation of older workers in middle-skill occupations reflects the reality that firms are not hiring into these jobs as incumbent workers retire.”

16 See Richard Freeman, “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: Urban Institute Press, 2007). He argues that demand for all groups of workers will slow over the next few decades due to offshoring and trade, and that these trends will swamp any on the supply side. But, so far, these arguments remain speculative.

17 See, for instance, the U.S. Chamber of Commerce, Rising to the Challenge (Washington DC: Center for Workforce Preparation, 2003); and the West Central Initiative, Study of Skilled Labor Shortages in West Central Minnesota. (Fergus Falls, MN: 2002).


21 For very high estimates of noncompletion rates of students at community colleges, see Thomas Bailey, Davis Jenkins, and Timothy Leinbach, “What We Know about Community College Low-Income and Minority Student Outcomes: Descriptive Statistics from National Survey” (New York: Community College Research Center, Columbia University, 2005). .

22 See results for the Opening Doors demonstration projects that have been evaluated by MDRC in Thomas Brok, “Young Adults and Higher Education: Barriers and Breakthroughs to Success,” The Future of Children 20 (1) (2010): 109-132.


About the author

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