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Abstract

Changing jobs after age 50 has become increasingly common. To assess the employment opportunities available to these job-changers, this study examines how the range of occupations in which they find jobs narrows as they age and whether this pattern differs by socioeconomic status (SES), using education as a proxy. The results indicate that workers in their early 50s who change jobs find employment in a reasonably similar set of occupations as do prime-age workers but that the opportunities increasingly narrow as they enter their late 50s and early 60s. These results vary by educational attainment. Interestingly, while job opportunities narrow as workers age, the number of opportunities available to older workers at any given age has improved significantly between the late 1990s and early 2010s – though the gains have gone primarily to better-educated older workers. Consistent with previous research, the study also finds: 1) employer policies that emphasize employee training, respect for seniority, and "hiring from within" create barriers to the hiring of older job-seekers; 2) older workers are less likely to be hired in jobs requiring strong cognitive skills; but 3) physical demands and adverse working conditions are not serious impediments.

Introduction

Job-changing after age 50 is increasingly common. The share of employed men ages 58 to 62 who were no longer working full-time with the employer they had at age 50 rose from 30 percent in 1983 to 42 percent in 2012; 48 percent of women that age were no longer working for the employers they had at age 50.[1] The ability of older job-changers to find suitable employment is important not just because it affects their current income. Whether they can find new employment also affects their ability to remain employed long enough to secure an adequate retirement income at a time when Social Security replacement rates are declining, the pension system has shifted from defined benefit (DB) pensions to 401(k)s, and longevity is rising.

In determining outcomes for older job-seekers, socioeconomic status (SES) may be an important factor. This study will use education as a measure of SES. To gauge the ability of older job-seekers to find suitable employment, it will explore the range of occupations in which they are hired. Specifically, the study examines the breadth of occupations available to workers who change jobs in the years prior to retirement, and whether their options narrow as they age. A series of papers by Hutchens (1986, 1988, 1991, 1993) shows that employment opportunities for job-seekers ages 55 and older, in the early 1980s, were concentrated in a set of occupations distinct from those available to prime-age workers. This study builds on Hutchens' research by: 1) investigating the extent to which job opportunities in 1996-2012 continued to be restricted for older workers, defined more narrowly in this study as ages 50-64; 2) whether the pattern differs between better- and less-educated workers; and 3) how access to occupations has changed during the period 1996-2012.

The results indicate that workers who change jobs in their early 50s find employment in a somewhat comparable set of occupations as do prime-age workers. As workers age, however, they find employment in an increasingly narrow set of occupations. This pattern of narrowing employment opportunities with age holds for both better- and less-educated workers, and for both men and women. Less-educated men see their opportunities narrow particularly early – in their late 50s.

The results also indicate a change in employment opportunities over time. At the beginning of the period under review, the late 1990s, employment options were actually more restricted for better-educated workers, relative to the options available to better-educated prime-

[1] Munnell and Sass (2008); authors' calculations from the *Current Population Survey* data.

age workers. Employment opportunities for older workers then generally expanded, especially for better-educated workers in their late 50s and early 60s. Most differences by education are now small. By contrast, differences by gender are now much greater: older men have fewer employment opportunities than older women relative to their prime-age counterparts, at every age and education level.

The analysis then identifies labor market characteristics associated with the reductions in access to occupations that occur with age. Confirming earlier findings in Hutchens (1986, 1988) and Hirsch, Macpherson, and Hardy (2000), the analysis finds that employers' "internal labor market" policies that respect seniority, provide on-the-job training, and "promote from within" create significant barriers to entry for older job-seekers, though these practices seem less important than they once were. The analysis also confirms results reported in Hirsch et al. (2000) that occupations requiring greater physical and cognitive skills hire fewer older workers. But unlike Hirsch et al. (2000), this study finds no evidence that computer use is a barrier to employment for older job-changers.

Finally, this study considers the consequences of the narrowing of employment opportunities for older workers, using median occupational earnings as the yardstick of job quality. The results show that occupations employing a relatively large share of older job-changers pay 8-16 percent less than occupations that employ relatively few, indicating the high cost of the narrowing of employment opportunities.

Previous Literature

The study of older workers' job opportunities begins with Hutchens (1986, 1988, 1991, 1993), who finds that few older job-changers find employment in occupations where significant shares of prime-age workers are hired. These studies attribute much of this narrowing of employment opportunities to internal labor market policies that employers established for managing and developing their workforce, such as hiring from within and respect for seniority, as well as DB pensions and mandatory retirement. These policies protect older employees but create barriers to entry for older job-seekers. Hutchens uses the fact that many older employees were working in occupations where few were hired as evidence that older workers were willing and able to do the work. These occupations were associated with long tenures, high wages for older workers, DB pensions, and mandatory retirement, which Hutchens used as evidence that

employers' internal labor market policies – and not worker preferences and abilities – were largely responsible for this narrowing of employment opportunities.

Subsequent research has largely confirmed Hutchens' findings, while expanding the list of factors that reduce older job-seekers' access to employment. Hirsch, Macpherson, and Hardy (2000) provide additional evidence that internal labor markets created significant impediments through most of the 1990s to the employment of job-seekers ages 50 and over. They also find occupations that require extensive training, computer use, non-standard hours, and union membership were also less open to older job-seekers, with hiring concentrated in "old person" occupations – low-paying, low-status jobs such as night watchman, retail clerk, or crossing guard. Older job-seekers face employer discrimination that further reduces hiring opportunities (Lahey 2006; Neumark and Song 2013). Adler and Hilber (2009) find that, in 2005, job-seekers ages 55-64 were disproportionately hired in growing industries, in industries that do not pay older workers significant earnings premiums (consistent with the findings of Hutchens and Hirsch et al.), and pay newly hired older workers less than the older workers they already employ.

Opportunities for older job-seekers today might not be as bleak as they were in the 1980s and early 1990s. Internal labor markets, which Hutchens cites as major impediments to their employment, seem less significant in a more fluid "knowledge-based" economy that emphasizes generic, as opposed to firm-specific, human capital (Karoly and Panis 2004; Osterman 2011).[2] Older workers are also much better educated than they were in the 1980s and are no longer less educated than younger workers (Burtless 2013). Educated job-seekers, who possess more generic human capital and longer expected work lives, should be more attractive to employers. Older workers make up a much larger share of the available labor force than in the past. They also likely make up a greater proportion of supervisors and human resources professionals and are more likely to be favorably disposed toward hiring older job candidates (Munnell, Sass, and Soto 2006). After the first Baby Boomers turned 50, in 1996, the ratio of workers under 50 to those over 50 rose from 4:1 in 1995 to 2:1 today. Since the displacement of older workers shows no upward trend – at least until the Great Recession (Farber 2015) – the rise in job-changing also seems largely due to quits, not layoffs (Munnell and Sass 2008). And while displaced older

[2] Mandatory retirement ages, mentioned by Hutchens (1986) as a component of internal labor market policy, were abolished for most workers in 1986.

workers generally see large wage reductions in their new jobs (Chan and Stevens 2004), older job-changers who separated voluntarily generally do not (Johnson and Kawachi 2007). Along with the growing prevalence of job-changing, people are also working longer, enhancing their ability to secure an adequate retirement income (Munnell 2015).

This study extends the Hutchens-style analysis of the breadth of employment opportunities for older job-seekers in several directions. It examines employment opportunities only for workers ages 50-64, who are approaching the traditional retirement age of 65; this focus differs from Hutchens, Hirsch et al., and Johnson and Kawachi, which assessed re-employment opportunities for all older workers – even those well past conventional retirement ages. Second, it tests the hypothesis that hiring opportunities narrow at an accelerating pace with age and are increasingly concentrated in low-paying occupations. Third, it tests the hypotheses that opportunities decline at a faster pace for older job-changers with less education – one proxy for SES – and at much the same pace for women and men. Fourth, it examines a more recent time period, when the well-educated Baby Boom generation swelled the ranks of older workers, when older workers became a larger share of the labor force, and when the nation moved toward a more fluid knowledge-based economy, testing the hypothesis that the cumulative effect of these factors expanded access to employment opportunities for older workers. Fifth, it assesses the contribution of occupational skill requirements and working conditions in explaining the narrowing of employment opportunities as workers age.

Data and Sample

The aim of the study is to assess the extent to which job-changers find employment in a narrower set of occupations as they age past their prime working years, defined as ages 30-49, and how such narrowing of occupational access varies by educational attainment. The basic unit of the analysis is an occupation. Over the period under review, we count up the number of workers by age, education, and gender hired in each occupation. To identify factors associated with changes in occupational access, we also collect the characteristics of each occupation, including compensation, turnover and tenure, required skills, and work conditions.

The analysis uses data on hiring within occupations and worker characteristics from the *Current Population Survey* (CPS), sponsored jointly by the U.S. Census Bureau and the U.S. Bureau of Labor Statistics. The CPS surveys respondents on a monthly basis eight times over a

16-month window and also fields regular supplementary surveys. The monthly survey provides information on the worker's age, occupation, gender, and education. Our outcome variable of interest – workers recently hired in a particular occupation – relies on data from one such supplement: the *Occupational Mobility and Job Tenure* supplement, collected biennially in January or February. Our sample uses observations from this supplement in nine even-numbered years between 1996 and 2012, which are available on the *Integrated Public Use Microdata Series* (IPUMS) website (King et al. 2010). The longer the time since the worker was hired by an employer, the greater the likelihood the worker changed jobs while working with that employer. To reduce this source of error in identifying hiring by occupation, the analysis restricts the sample to workers hired within the two years that preceded the job tenure supplement.[3]

The sample is divided by gender and education, with educational attainment split into two roughly equal subgroups: workers who have, and do not have, at least some college experience. To aggregate the data on hiring by occupation, we use three-digit occupations, the lowest level of aggregation available in the CPS, when the sample includes at least 20 prime-age workers of a given education and gender combination hired in that occupation over the nine years surveyed. Three-digit occupations that do not have 20 prime-age hires are aggregated at the two-digit level. For example, 24 better-educated prime-age men were hired as messengers, a three-digit occupation, across the years surveyed; messengers, therefore, are included in the sample without further aggregation. In contrast, only nine better-educated prime-age men were hired as postal clerks (excluding mail carriers) and 11 as mail clerks (outside of the postal service) across all years of the survey; these two occupations were combined at the two-digit level ("mail and message distributing occupations, not elsewhere classified").

When the sample is divided by gender and education, it has 1,704 gender- and education-specific occupation cells, compiled from 381 unique three-digit occupations. This sample includes 95 percent of the original sample of older hires, missing hiring in only a few small occupations. Table 1 presents the number of occupations in each cell with a sufficient number of prime-age workers and the share of workers of a particular age, gender, and education level

[3] Hutchens (1988, 1991) and Hirsch et al. (1999) use a five-year window. A two-year window reduces the sample size but improves the probability that workers will have been hired to perform their current job. Since most of the results reported below using the smaller sample size are statistically significant, we opted to use a two-year window to identify occupational hires, but results are robust to using the five-year definition of new hires.

included in these occupations. Sample sizes decline when the sample is further divided into groups defined by gender and education or is divided into three time periods to assess change over time (1996-2000, 2006-2008, and 2010-2012). For example, only 176 occupations have enough better-educated prime-age men to be included in the sample for better-educated older workers; these 176 occupations, however, account for about 73 percent of the older, better-educated men in the CPS sample.

The CPS also provides data on occupational characteristics used in the analysis, such as the occupation's 10-year employment growth and the national unemployment rate. Other characteristics derive from the *Annual Social and Economic Characteristic* supplement, which is fielded each March. From this supplement, we calculate each occupation's median earnings (by age, gender, and education); the share of employees in each occupation working full-time, part-time voluntarily, and part-time involuntarily; firm size; and the share of workers with a pension and in a union.[4] The *Occupational Mobility and Job Tenure* supplement also provides information on the share of workers in the occupation with more than 15 years of tenure and the turnover rate (the share of workers with less than two years of tenure). This information is used to identify employer personnel policies that may restrict employment opportunities for older job-seekers and the willingness and ability of older workers to do the work required by a particular occupation, as seen in Hutchens (1986, 1988) and Hirsch et al. (2000).

The O*NET database, produced by the U.S. Department of Labor's Employment and Training Administration in conjunction with the North Carolina Department of Commerce, provides further information on the required skills that could affect the ability of older job-seekers to find employment in a particular occupation, as used by Hirsch et al. (2000). For each occupation, O*NET provides two scores for 59 distinct skills: that skill's importance and the level of skill required for current employees to perform adequately in their position.[5] We calculate the product of the two scores and collapse the skills into 13 categories: active learning, communication, judgment, education, experience, working outdoors, social skills, math skills, strength, physical skills, computer skills, dependability, and exposure to hazards.[6]

[4] DB pension coverage is a useful measure of internal labor markets, since DB plans are preferred by employees aiming for long tenures at a single employer, but the CPS does not specify whether pensions are DB plans or defined contribution (DC) plans. During the 1996-2012 period covered in this study, nearly all pensions given to new hires will be DC plans, but occupations with long-tenured employees may maintain a substantial DB coverage rate.
[5] We use only 59 of the thousands of minutely defined skills in the O*NET database.
[6] The two scores – importance and level of skill required – are both normalized to vary over a range from 0 to 1.

Methodology

To assess the extent to which employment opportunities narrow, the project compares the share of older workers to the share of prime-age workers hired in each occupation. We compare the pattern of occupational hiring: 1) by age; 2) by education and gender; and 3) over time. Regression analysis identifies factors associated with hiring differences, such as employer personnel practices, skill requirements, and working conditions. Finally, we compare earnings for the typical worker in occupations that hire a larger share of older workers to those occupations that are more limited in their hiring of older workers as a measure of the effect of occupational access on the quality of employment opportunities for older job-seekers.

The key variable in the analysis is the occupational hiring ratio, OH_j, originally specified by Hutchens (1988 and 1991). OH_j is defined as the ratio of the share of older workers hired in occupation *j* to the share of prime-age workers hired in occupation *j*:

$$OH_j = \frac{\frac{HireOld_j}{\sum_j HireOld_j}}{\frac{HirePrime_j}{\sum_j HirePrime_j}} \qquad (1)$$

$\frac{HireOld_j}{\sum_j HireOld_j}$ is the share of older workers hired over the past two years in occupation *j* as a percent of the older workers hired in all occupations. $\frac{HireOld_j}{\sum_j HireOld_j}$ is the share of prime-age workers hired in occupation *j* as a percent of prime-age workers hired in all occupations. For example, over the full sample period, three better-educated women ages 50-54 had been hired as veterinarians within the last two years, out of 2,995 hires of college-educated women at those ages in all occupations combined. Veterinarians thus make up 3/2995 = 0.10 percent of the workers hired in this age-education-gender group. In that same time period, 24 prime-age better-educated women were hired as veterinarians, or 0.11 percent of the 20,967 prime-age workers hired in this education-gender group. The *OH* ratio for veterinarians in this age, education, and gender combination is 0.10/0.11 = 0.88.

A low ratio of older workers to prime-age workers hired indicates that a smaller share of older job-changers is hired in the occupation than prime-age job-changers; a high ratio indicates that the occupation hires a relatively large number of older workers. We take ratios between

0.75 and 1.25 to indicate that older workers have much the same access to employment in the occupation as prime-age workers.

Hiring ratios are calculated separately for each occupation for men and women with and without at least some college education; at ages 50-54, 55-59, and 60-64; in years 1996-2000, 2002-2006, and 2008-2012. In each case, the denominator of OH_j is the share of prime-age workers of the same gender and educational attainment sampled in the same period.

We use these occupational hiring ratios to evaluate the distribution of job opportunities for older workers in two different ways. First, we use histograms to assess the extent to which hiring opportunities persist – or narrow – for men and women with and without college experience as they age past their prime working years. The histograms reflect the share of older hires that end up in an occupation with occupational hiring ratios in a given range.[7]

Following Hutchens (1991), we also use occupational hiring ratios to construct Lorenz Curves and calculate Gini coefficients that indicate the degree of concentration of job opportunities in a subset of occupations as workers age. Lorenz Curves are most commonly used to assess income and wealth inequality.[8] In this analysis, occupations are sorted according to their hiring ratios, from low to high. The Lorenz Curves then plot, on the y axis, the cumulative share of older workers hired and, on the x axis, the cumulative share of prime-age workers hired. A perfectly equal share of hiring at both older ages and prime ages in all occupations would yield a "curve" on the 45-degree line.

But when hiring is not equally distributed, the Lorenz Curve at first rises slowly, then more steeply at the right-hand end of the plot, indicating that hiring is concentrated in a subset of occupations. The Gini coefficient, the ratio of the area between the Lorenz Curve and the 45-degree line to the entire area below the 45-degree line, measures the extent of this concentration. The greater the concentration of hiring, the greater is the gap between the Lorenz Curve and the 45-degree line, and the greater the Gini coefficient.

The Gini coefficient is calculated by estimating a regression of the cumulative share of older hires on a quadratic function of the cumulative share of prime-age hires. This estimation yields a fitted curve; the Gini coefficient is the ratio of the area between the 45-degree line to the

[7] We do not use CPS-provided weights, because the analysis stacks together multiple years.
[8] See Kennickell (2009) for a survey.

right triangle made by the 45-degree line.[9] Gini coefficients are calculated separately for each age group and by gender, education, and time period. A high Gini coefficient indicates that older workers find employment in a relatively distinct set of occupations as compared to prime-age workers.

The histograms and Gini coefficients are used to test the hypotheses that occupational access narrows as workers pass their prime working years. We calculate the share of workers who are hired in occupations with hiring ratios between 0.75 and 1.25 to measure the persistence of job opportunities with age, as it indicates that an occupation hires approximately equal shares of older and prime-age workers. If access narrows, the share of hiring in this range will fall and the share of hiring in occupations with ratios in excess of 1.25 will rise, as will Gini coefficients. We use these measures to test whether the concentration of employment opportunities by occupation occurs at a faster pace for older job-seekers with less education, and whether occupational access evolves differently by gender.

The project then identifies factors associated with differences in occupational hiring ratios. We estimate a regression using the occupation's hiring ratio as the dependent variable. Because an occupation's hiring ratio could differ, by example, between better- and less-educated men in their late 50s, the sample consists of up to 12 observations per occupation: one for each possible age-gender-education combination. The explanatory variables include indicators for age, gender, and education to account for these differences; the coefficients on these variables provide a formal test for whether occupational hiring ratios differ across the subgroups.[10]

The remaining explanatory variables examine why occupations differ in their hiring of older workers. These variables include: 1) proxies for the importance of internal labor markets: the share of the occupation's workforce with more than 15 years of tenure, the turnover rate (the ratio of hires to all employees), and the importance of on-the-job training; 2) indicators of the supply of older workers with the skills required in an occupation: the importance of specific skills from O*NET, as well as occupational employment growth; 3) indicators for the importance of worker preferences: the share of the occupation's workforce that voluntarily or involuntarily works part time and typical working conditions; 4) indicators of the importance of institutional

[9] The estimation that produces the fitted curve also produces a confidence interval for that curve, allowing for hypothesis testing of whether the fitted curve is statistically different from the 45-degree line.

[10] In the regression, each observation is weighted by that occupation's total hires over age 50. Weighting assures that occupations that have a greater share of the labor market also have a greater influence on the estimation.

structures: the share of employers by firm size and the share of the workforce that is unionized; 5) compensation, including the log of median occupational earnings among all employees, and the share with pension coverage (DB and DC combined); and 6) the national unemployment rate in the month of the CPS supplement as an indicator of macroeconomic conditions. Table A1 presents summary statistics for these variables.

In an alternative specification of the regression, we include the occupational employment ratio, a measure that is analogous to the hiring ratio. The occupational employment ratio, OE_j, compares the share of all older workers employed in an occupation to the share of all prime-age workers employed in the occupation, irrespective of tenure:

$$OE_j = \frac{\frac{Older\ Workers_j}{\sum_j Older\ Workers_j}}{\frac{Prime\ Workers_j}{\sum_j Prime\ Workers_j}} \quad (2)$$

This measure is similar to metrics used in Hutchens (1986, 1988) and Hirsch et al. (2000) to control for labor supply – the size of the pool of individuals who are willing and able to work in a given occupation – and help identify the effect of employer policies on the employment opportunities of older job-changers.

Finally, the project tests whether the narrowing of occupational access affects the quality of employment opportunities, using the occupation's earnings as the yardstick. For each age-education-gender subgroup, we sort occupations by their hiring ratios, from low to high, on the x-axis and plot median earnings for that group of hires on the y-axis. A regression line, weighted by the number of total older hires in the occupation, indicates whether jobs that hire a disproportionate share of older workers are low-paying jobs. We establish the magnitude of the relationship between access and pay by comparing the predicted value of earnings from this fitted line at the 25th and 75th percentiles of the occupational hiring ratio distribution (weighted by total older hires); the 25th percentile consists of occupations that are relatively restricted to prime-age workers, whereas the 75th percentile consists of occupations that are relatively more open to older workers.

Results

The key variable in the analysis is the occupational hiring ratio, which measures the degree to which employment opportunities across occupations become more limited as workers age beyond their prime years. Using these ratios, the analysis first examines the degree to which older job-changers are able to find employment in a similar set of occupations as prime-age workers, at what ages options diverge, and how this pattern varies by educational attainment. It then identifies occupations where employment is more or less accessible to older job-changers. Next, we use Gini coefficients to quantify the degree to which hiring is concentrated in a distinct set of occupations and examine how this concentration has changed over time. We then estimate regressions that identify the factors associated with the occupations that hire a greater share of older workers. Finally, we determine whether the narrowing of opportunities by occupation is associated with a decline in job quality by examining the relationship between hiring ratios and median earnings.

Persistence of Employment Opportunities with Age

Figure 1 displays the histogram of hiring ratios for men with and without college experience (across the columns) in each age group: 50-54, 55-59, and 60-64, respectively. For men of both education levels who are in their early 50s, more than half of recent hires work in occupations in which the share of older hires is approximately equal to the share of prime-age hires – that is, their employment opportunities largely persist as they move from their prime years into their early 50s. While some hiring does occur in occupations that disproportionately hire older workers, as identified in earlier studies, only 3 percent are in occupations with hiring ratios greater than 2.

When workers reach their late 50s and early 60s, hiring increasingly shifts to occupations that disproportionately hire older workers, but the pace at which this occurs differs by SES levels, as measured by education. The share of better-educated men in their late 50s hired in occupations with ratios near one is almost equal to the share in their early 50s – more than 50 percent. For less-educated men in their late 50s, however, the share of hiring in occupations that absorb approximately equal shares of older and prime-age job-changers falls to 40 percent. Differences based on educational attainment diminish among men in their early 60s. A minority of men that age in both the high- and low-education groups – 34 percent and 27 percent,

respectively – are hired into occupations with hiring ratios near one. About half find employment in occupations with ratios greater than 1.25, including about a quarter with ratios exceeding 2 – occupations that may be considered "old people jobs."

Figure 2 repeats this analysis for women. As with men, most women in their early 50s are hired in jobs with relatively equal opportunities for older and prime-age workers. In contrast to men, less-educated women in their late 50s are better able to maintain their employment opportunities: the proportion of better-educated women hired in occupations with a hiring ratio near one falls from 57 to 48 percent, but only from 63 to 60 percent for less-educated women. At ages 60-64, occupational opportunities for women with both education levels converge, as they do for men: about 40 percent of women in both the high- and low-education groups are hired in occupations with a ratio near one. Another 40 percent in each group are hired in occupations with a ratio exceeding 1.25, including about 10 percent in excess of 2.

More and Less Accessible Occupations for Older Job-Changers

What kinds of jobs are "old-people jobs"? Table 2 lists the top five and bottom five occupations, ranked by their hiring ratios – the ratio of older to prime-age hiring shares – in the right hand column; this ranking includes all occupations in which at least two older workers in the sample are hired in each group. Some of the occupations in this list are also identified in Hirsch et al. (2000) as "old occupations," including supervisors of guards, crossing guards, messengers, and taxi drivers. A large share of older workers is hired to fill vacancies in occupations in long-term decline, such as farmers, tailors, and dressmakers and seamstresses. Sales demonstration, on the other hand, is a growing occupation apparently suited to older workers.

Table 2 also lists occupations with low ratios that rarely hire older workers. Unlike Hirsch et al. (2000), our list contains only one occupation – kindergarten teachers – that display internal labor market characteristics such as long tenures and DB pensions, reflecting the move away from these personnel policies. Other occupations that hire few older workers are physically stressful or require workers to keep up with improving technology, such as chemistry, heating and air conditioning repair, and drilling. Hiring in some medical professions – including dentistry, physical therapy, and pharmacy – is dominated by young people, which could reflect

recent employment growth or rapid technical change, explaining the dearth of older workers who are qualified.

Measuring the Concentration of Older Hiring by Occupation

The Lorenz curves in Figure 3 for the three age groups – 50-54, 55-59, and 60-64, each plotted relative to prime-age (30-49) hires – provide further evidence of narrowing job opportunities as workers age. The Lorenz curves move further from the 45-degree line for older age groups, indicating that older job-changers find employment in an increasingly concentrated set of occupations.

The Gini coefficients in the first three rows of Table 3 quantify the degree to which older hires become concentrated in particular occupations as they age. At ages 50-54, the Gini coefficient is 0.15, a level that is low but statistically distinct from zero.[11] The Gini rises – and the concentration of older workers in an occupation increases – to 0.21, a statistically significant increase, at ages 55-59, and increases further to 0.30 at 60-64. The confidence interval around each Gini is compact, so each increase is statistically significant.

Figures 4 and 5 plot separate Lorenz curves for men and women, respectively, by education level and age. Each individual curve can be compared with its Gini coefficient in Table 3. The Lorenz curves and Gini coefficients show similar trends: hiring concentration rises with age in all four worker groups, with the jump occurring sooner for less-educated men. Increases in hiring concentration are somewhat smaller for women, especially for better-educated women. But by ages 60-64, the concentration is very similar for women in both of the educational groups. It is also very similar for men in both of the educational groups. However, hiring opportunities are clearly more limited for older men (with Gini coefficients about 0.4) than for older women (with Gini coefficients about 0.3).[12]

[11] For comparison, no country's income distribution has a Gini coefficient of less than 0.20 going back to 2006 (World Bank 2015). The lowest Gini coefficient for a U.S. state's income distribution on record – going back to 1917 – is 0.23 for Arizona in 1921 (Frank 2015).

[12] The Gini coefficients for the groups separated only by age (the first three rows) are not a weighted average of the subgroups defined by gender and education, because the number of occupations that are large enough for inclusion varies across the groups. Similarly, the all-period Gini coefficients are not a weighted average of the period-specific Ginis because of decreasing sample size.

Hiring Concentration Over Time

Table 4 reports changes in Gini coefficients for each subgroup across three different time periods: 1996-2000, 2002-2006, and 2008-2012.[13] The Gini coefficients have generally declined over time, indicating that job opportunities expanded for most older workers.

Nevertheless, the change in opportunities differs substantially by SES. In the late 1990s, employment opportunities had been narrower at each of the three older age ranges for better-educated men than for their less-educated counterparts. By the early 2010s, Gini coefficients had fallen sharply for more-educated men in their late 50s and early 60s. In contrast, less-educated men saw little change in their Gini coefficients at 50-54 and at 60-64. But a large increase in their Gini coefficient at age 55-59 indicates that opportunities contracted for less-educated men in their late 50s.

Women in both education groups saw a decline in their Gini coefficients. But as with men, this improvement in job opportunities was greater for better-educated women at ages 55-59 and 60-64.

In summary, the major change was a significant expansion of opportunities for better-educated job-changers of both genders in their late 50s and early 60s. In contrast, less-educated men – but not women – saw their opportunities become increasingly narrow in their late 50s. By the early 2010s, educational differences are small, whereas differences by gender are large.

The trends over time for most groups differ from the results reported in Hirsch, et al. (2000); that study finds little improvement, albeit for an earlier time period and including individuals age 65 and over who may focus on "retirement jobs." The broadening of opportunities for better-educated workers in this study contrasts with the decline among less-educated men, which is consistent with the well-documented increase in earnings inequality. That better-educated older job changers are the primary beneficiaries suggests that these changes are due to a decline in the importance of internal labor markets and a shift to a more fluid, knowledge-based economy, as generic human capital – for which better-educated workers are at an advantage – becomes increasingly important relative to firm-specific human capital.

[13] The histograms plotted by time period tell a similar story to the Gini coefficients.

Identifying the Correlates of Occupational Access

Why are some occupations more restrictive in their hiring of older workers? Table 5 reports estimates of the regression of the occupational hiring ratio on various characteristics of the occupation, the employer, and work arrangements. The first column reports estimates where the dependent variable in the regression is the occupational hiring ratio for each age-gender-education combination. The second column includes the occupational employment ratio as an additional control that accounts for labor supply.

The first four rows provide a formal test of whether the occupational hiring ratio differs by age, gender, and education. Hiring ratios do not appear to differ much by age, rising in some occupations as age rises and declining in others. In keeping with the descriptive results above, hiring ratios are 18 percentage points lower for women, even after controlling for occupational differences. However, hiring ratios do not differ by education; the advantage for better-educated men over their less-educated counterparts identified above is presumably offset by the advantage for less-educated women.

Two variables seek to identify the relationship between internal labor markets and hiring ratios: occupational turnover rates and the incidence of long tenures. Turnover rates are not significantly associated with the hiring of older workers, but the proportion of an occupation's workforce with tenure of 15 years or longer is associated with lower hiring rates. The effect, however, is small: a 10-percentage-point increase in the share of long-tenured workers is associated with a statistically significant 0.09-percentage-point increase in the hiring ratio. This result could reflect a weakening of internal labor markets as a barrier to the employment of older job-seekers.

The next set of variables in Table 5 accounts for the skills necessary to perform an occupation's duties, as derived from the O*NET database. Occupations requiring greater communication and social skills are associated with more hiring of older workers. The evidence that numerical ability and computer skills act as an impediment to hiring older people is weak – in contrast to studies using older cohorts like Hirsch et al. (2000) and Willis (2013). The mental toll of aging is evident in these results, however: jobs that require cognitive flexibility hire a smaller share of older workers, judging by the negative and statistically significant coefficients on both active learning and judgment (which includes complex problem solving and critical thinking). Experience and training are also correlated with less hiring of older workers, which is

to be expected, given that older workers have less time left to benefit from training. The estimate that is most surprising is dependability, which is also associated with less hiring of older workers – seeming to contradict previous work suggesting that older workers are valued for being more dependable than younger workers (AARP 2005). One explanation could be that workers in their 30s and 40s are already sufficiently dependable to take away this advantage. Another, suggested by Hutchens (2006), is that dependability could be a characteristic of jobs that employers typically fill by internal hires.

Employment growth in an occupation over the previous 10 years is associated with a statistically significant decrease in hiring ratios – meaning less hiring of older workers. This finding echoes Hirsch et al. (2000) and could reflect a lack of older workers with the required skills. Adler and Hilber (2009), by contrast, find that *industry* employment growth is associated with greater employment of older job-changers. This result suggests that individuals with occupation-specific human capital are able to move across industries, but individuals with industry-specific human capital cannot move across occupations.

Hiring ratios may also reflect labor supply, with older workers seeking out jobs with particular characteristics. Hirsch et al. (2000) found evidence that older women seek out part-time employment, raising hiring ratios in occupations characterized by significant part-time work. Our results, which exclude workers age 65 and older, find no statistically significant relationship between voluntary part-time work and occupational hiring ratios. This result is true not only for all workers in our sample, as shown in Table 5, but also for women alone. Occupations with a higher share of workers who are part-time involuntarily actually hire a smaller share of older workers. Like Hirsch et al. (2000), we also find that working conditions that could reduce the willingness of older workers to seek employment in an occupation, such as outdoor work, strength, or physical demands, are not strongly related to hiring ratios. The one exception is that a smaller share of older than prime-age workers is hired in occupations that involve exposure to hazards.

When we control for labor supply directly using the occupational employment ratio, the relationship between hiring ratios and part-time work – and, indeed, all other variables – is essentially unaffected. The coefficient on the occupational employment ratio itself is statistically significant, but the relationship is weak: the conditional correlation is only 0.008. This weak

result indicates either that the occupational employment ratio is a poor proxy for labor supply, or that labor demand drives most of the differences in hiring of older workers.

Our results show hiring of older workers in occupations that are heavily unionized is no different than in occupations with little union coverage. This result differs from Hirsch et al. (2000), which finds union jobs are less available to older workers. Our result could reflect a shift away from unionized industries, such as autos and steel, which are characterized by long tenures with a single employer. Our results also showed that firms with fewer than 25 employees are more likely to hire older workers, perhaps reflecting factors such as their personal relationships with older business owners or older workers moving into small consulting firms. But the results find that slightly larger firms with 25-99 employees are less likely to hire older workers than firms with 100 or more employees, which might reflect greater sensitivity to the higher cost of health insurance for older workers.

The regression estimates show that occupations paying higher wages are associated with lower hiring ratios – in other words, they are less likely to hire older workers. This result is consistent with findings reported in Hutchens (1986) and Adler and Hilber (2009). On the other hand, another aspect of compensation in the regression – pension coverage – is associated with a statistically significant increase in hiring ratios. This finding is quite different from those reported in Hutchens (1988) and Hirsch et al. (2000); these studies used DB pensions as an internal labor market indicator, which they found to be associated with a significant reduction in the employment of older job-seekers. Today, most pension plans are 401(k)s, which are not primarily an instrument that employers use to manage internal labor markets, but are designed, in part, to appeal to a more mobile workforce. The CPS data make no distinction between DB and 401(k) plans.

Overall, the independent variables included in the regression explain only a small portion of the variation in hiring ratios: the R^2 is 0.10, with an adjusted R^2 of 0.09. Still, the results suggest that occupations that hire a greater share of older workers are lower-paying, require greater use of social and communication skills, and are less physically and cognitively taxing. Internal labor markets are still at least somewhat important: some occupations hire fewer older workers because they are already reliant on long-tenured employees or they invest in on-the-job training.

Comparing Earnings by Occupations' Older Hiring

A narrowing of occupational hiring as workers age does not necessarily mean that hiring is concentrated in less attractive occupations. The study uses average earnings as an indicator of occupational quality. Figure 6 plots the relationship between the occupational hiring ratio and the occupation's average earnings for men, separately by age and educational attainment, and fits a linear regression line to the data. All of the lines in the left column are downward sloping for better-educated men, indicating that a higher occupational hiring ratio – a greater tendency to hire older workers – is associated with lower earnings, suggesting they may miss out on some of the better-paying jobs. For better-educated men ages 50-54, the slope for the fitted line for better-educated men is statistically significant. This line predicts that an occupation at the 75th percentile of the hiring ratio pays 9.9 percent less to the median employee than an occupation at the 25th percentile. For better-educated men ages 55-59, the slope of the fitted line is statistically insignificant. But for 60-and-over workers, the slope is again statistically significant and indicates an earnings decline of 7.9 percent from the 25th to the 75th percentile ratios.

For less-educated men under 60, the fitted lines are positive but statistically insignificant, indicating a lack of evidence that wages and occupational hiring patterns are related. But the pattern for 60-plus, less-educated men – similar to their better-educated counterparts – is associated with lower earnings: the slope of the fitted line is negative and statistically significant, with a large 8.1-percent decline from the 25th to 75th percentile ratios.

Figure 7 repeats this exercise for women and finds that the earnings reductions are larger than those identified for men. The lines are statistically significant for better-educated women ages 55-59 and 60-64 and for less-educated women ages 60-64. Better-educated women ages 55-59 and 60-64 have 13.3 percent and 11.8 percent lower earnings levels at the 75th percentile hiring ratios than at the 25th percentile ratios, respectively. Less-educated women ages 60-64 have 15.8 percent lower earnings levels under that same comparison. While the results reported above indicate that the employment options for older women job-changers narrow less than those for men, these results suggest that the cost of such narrowing on job quality could be greater for women. But for both men and women, these results also emphasize how costly restricted hiring at older ages can be, particularly for the oldest individuals in our sample.

Conclusion

A generation ago, older workers approaching retirement were unlikely to change jobs. Today, nearly half of older workers change jobs in their 50s. The availability of employment opportunities has become even more important for older workers who need to extend their careers to compensate for falling Social Security replacement rates and the decline of DB pensions. This paper explores the potential challenges faced by older job-seekers, with an emphasis on how the impacts vary by socioeconomic status (SES), using education as a proxy.

The paper updates research on the previous generation of older workers, primarily Hutchens (1986, 1988) and Hirsch et al. (2000), by focusing on job-changers between 50 and 64, and by examining how the evolution of employment opportunities differs by educational attainment. We find that workers who change jobs in their 50s now have relatively similar job opportunities as prime-age workers, with the range of available occupations narrowing significantly only in their early 60s. The exception is less-educated men, who see their options narrow earlier – in their late 50s. The greater divide in occupational access is gender, not education: men see their employment opportunities narrow much more than women as they age past their prime working years.

The results confirm earlier findings that the narrowing of occupational opportunities is associated with the presence of internal labor markets and with the skills associated with supervisory positions, which tend to be filled internally, as well as cognitive skills, which are expected to decline at older ages. In contrast to earlier work, however, we find little evidence that computer and numeracy skills limit older workers' job opportunities. The results also show that older workers are disproportionately hired in occupations that pay relatively low wages, with occupations that hire more older workers paying 8-16 percent less than occupations hiring relatively fewer older workers.

These results should be interpreted with caution. Most importantly, the sample included only job-seekers who found employment – not those who failed. As such, it provides a rosier picture of the labor market prospects for older workers. Since less-educated workers are far more likely to drop out of the labor force in their 50s, this caveat is especially true for them.

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Table 1. *Sample Size for Occupation Groups Defined by Age, Sex, and Education*

	Number of occupations	Percent of older hires included
All	284	94.9%
Men with some college or more	176	73.4
Men with no college	124	60.7
Women with some college or more	153	80.6
Women with no college	115	64.5

Note: Inclusion in the sample requires at least 20 prime-age hires.
Source: U.S. Census Bureau, *Current Population Survey Occupational Mobility and Job Tenure Supplements,* 1996-2012.

Table 2. *Top 5 and Bottom 5 Occupations Ranked by Occupational Hiring (OH) Ratio, by Age*

Occupation	Older hires	Prime hires	OH ratio
Ages 50-54			
Top 5			
Messengers	23	72	2.20
Miscellaneous material moving occupations	7	21	2.30
Tailors	12	34	2.43
Supervisors of guards	11	31	2.44
Other mining occupations	11	27	2.81
Bottom 5			
Helpers, surveyors	2	68	0.20
Pharmacists	5	95	0.36
Drillers of oil wells	2	38	0.36
Other health and therapy	2	38	0.36
Chemists	3	57	0.36
Ages 55-59			
Top 5			
Public transportation attendants and inspectors	9	31	2.99
Dressmakers and seamstresses	12	37	3.34
Supervisors of guards	11	31	3.66
Farmers (owners and tenants)	27	66	4.22
Sales demonstrators / promoters / models	12	29	4.27
Bottom 5			
Dental assistants	3	140	0.22
Athletes, sports instructors, and officials	2	73	0.28
Waiter/waitress	20	728	0.28
Roofers and slaters	4	136	0.30
Helpers, surveyors	2	68	0.30
Ages 60-64			
Top 5			
Taxi cab drivers and chauffeurs	31	166	3.66
Sales demonstrators / promoters / models	6	29	4.06
Guides	9	35	5.04
Farmers (owners and tenants)	22	66	6.53
Crossing guards and bridge tenders	17	32	10.41
Bottom 5			
Heating, air conditioning, and refrigeration mechanics	2	185	0.21
Hairdressers and cosmetologists	5	453	0.22
Door-to-door sales, street sales, and news vendors	3	250	0.24
Physical therapists	2	145	0.27
Kindergarten and earlier school teachers	5	347	0.28

Source: *Current Population Survey Occupational Mobility and Job Tenure Supplements,* 1996-2012.

Table 3. *Gini Coefficients by Age, Sex, and Education*

	Gini coefficient	Confidence interval		Number of occupations
		Lower	Upper	
All				
Age 50-54	0.153	0.152	0.154	285
Age 55-59	0.212	0.211	0.213	285
Age 60-64	0.301	0.299	0.303	285
Men, some college or more				
Age 50-54	0.207	0.206	0.208	177
Age 55-59	0.258	0.255	0.260	177
Age 60-64	0.397	0.392	0.401	177
Men, no college				
Age 50-54	0.204	0.202	0.206	133
Age 55-59	0.313	0.311	0.316	133
Age 60-64	0.382	0.379	0.386	133
Women, some college or more				
Age 50-54	0.191	0.190	0.193	161
Age 55-59	0.239	0.237	0.240	161
Age 60-64	0.301	0.299	0.304	161
Women, no college				
Age 50-54	0.146	0.145	0.147	116
Age 55-59	0.206	0.204	0.208	116
Age 60-64	0.298	0.297	0.300	116

Source: Authors' estimates from U.S. Census Bureau, *Current Population Survey* (CPS), 1996-2012.

Table 4. *Gini Coefficients by Period, for Age, Sex, and Education Groups*

	1996-2000		2002-2006		2008-2012	
	Gini	N	Gini	N	Gini	N
All						
Age 50-54	0.194	209	0.214	212	0.176	182
Age 55-59	0.259	209	0.281	212	0.237	182
Age 60-64	0.395	209	0.405	212	0.329	182
Men, some college or more						
Age 50-54	0.259	107	0.259	101	0.229	93
Age 55-59	0.339	107	0.306	101	0.257	93
Age 60-64	0.519	107	0.431	101	0.438	93
Men, no college						
Age 50-54	0.251	66	0.200	75	0.222	62
Age 55-59	0.320	66	0.282	75	0.373	62
Age 60-64	0.432	66	0.455	75	0.424	62
Women, some college or more						
Age 50-54	0.246	98	0.251	103	0.239	92
Age 55-59	0.364	98	0.294	103	0.260	92
Age 60-64	0.492	98	0.326	103	0.329	92
Women, no college						
Age 50-54	0.196	81	0.190	68	0.167	49
Age 55-59	0.253	81	0.250	68	0.248	49
Age 60-64	0.376	81	0.260	68	0.341	49

Source: Authors' estimates from 1996-2012 CPS.

Table 5. *Summary Statistics and Estimates from Regression of Occupational Hiring Ratio on Occupational Characteristics*

	(1)		(2)	
	Coef	SE	Coef	SE
Age 50-54	-0.005	(0.036)	-0.007	(0.036)
Age 60-64	0.075	(0.046)	0.072	(0.045)
Female	-0.184	(0.040) ***	-0.196	(0.040) ***
Some college or more	0.009	(0.035)	-0.006	(0.036)
Share with 15+ years of tenure	-0.922	(0.382) **	-0.976	(0.385) **
Turnover rate	0.047	(0.093)	0.06	(0.093)
Active learning	-3.553	(1.879) *	-3.351	(1.873) *
Communication skills	1.243	(0.598) **	1.177	(0.597) **
Judgment	-1.359	(0.794) *	-1.467	(0.791) *
Education	-0.039	(0.512)	0.016	(0.510)
Experience and training	-3.735	(1.139) ***	-3.705	(1.140) ***
Social skills	1.972	(0.720) ***	1.975	(0.720) ***
Numerical ability	-0.119	(0.216)	-0.112	(0.215)
Computer skills	0.951	(0.783)	1.057	(0.770)
Dependability	-1.21	(0.354) ***	-1.215	(0.348) ***
10-year growth in employment	-54.524	(27.944) *	-53.712	(27.975) *
Involuntary part time	-1.965	(0.596) ***	-1.994	(0.598) ***
Voluntary part time	-0.22	(0.282)	-0.241	(0.281)
Exposure to hazards	-5.236	(1.257) ***	-5.306	(1.250) ***
Working outdoors	0.507	(0.614)	0.553	(0.613)
Strength	0.796	(0.663)	0.818	(0.662)
Physical skills	0.85	(0.742)	0.721	(0.737)
Union coverage	0.08	(0.184)	0.088	(0.184)
Share of firms with < 24 employees	0.367	(0.289)	0.348	(0.288)
Share of firms with 25-99 employees	-0.937	(0.321) ***	-0.92	(0.321) ***
Log of real weekly earnings	-0.361	(0.106) ***	-0.331	(0.107) ***
Pension coverage	0.419	(0.168) **	0.396	(0.167) **
Unemployment rate	0.337	(0.095) ***	0.328	(0.095) ***
Occupational employment ratio			0.008	(0.002) ***
Constant	2.967	(0.857) ***	2.887	(0.860) ***
Sample size	1,704		1,704	
R^2	0.102		0.105	
Adjusted R^2	0.087		0.09	

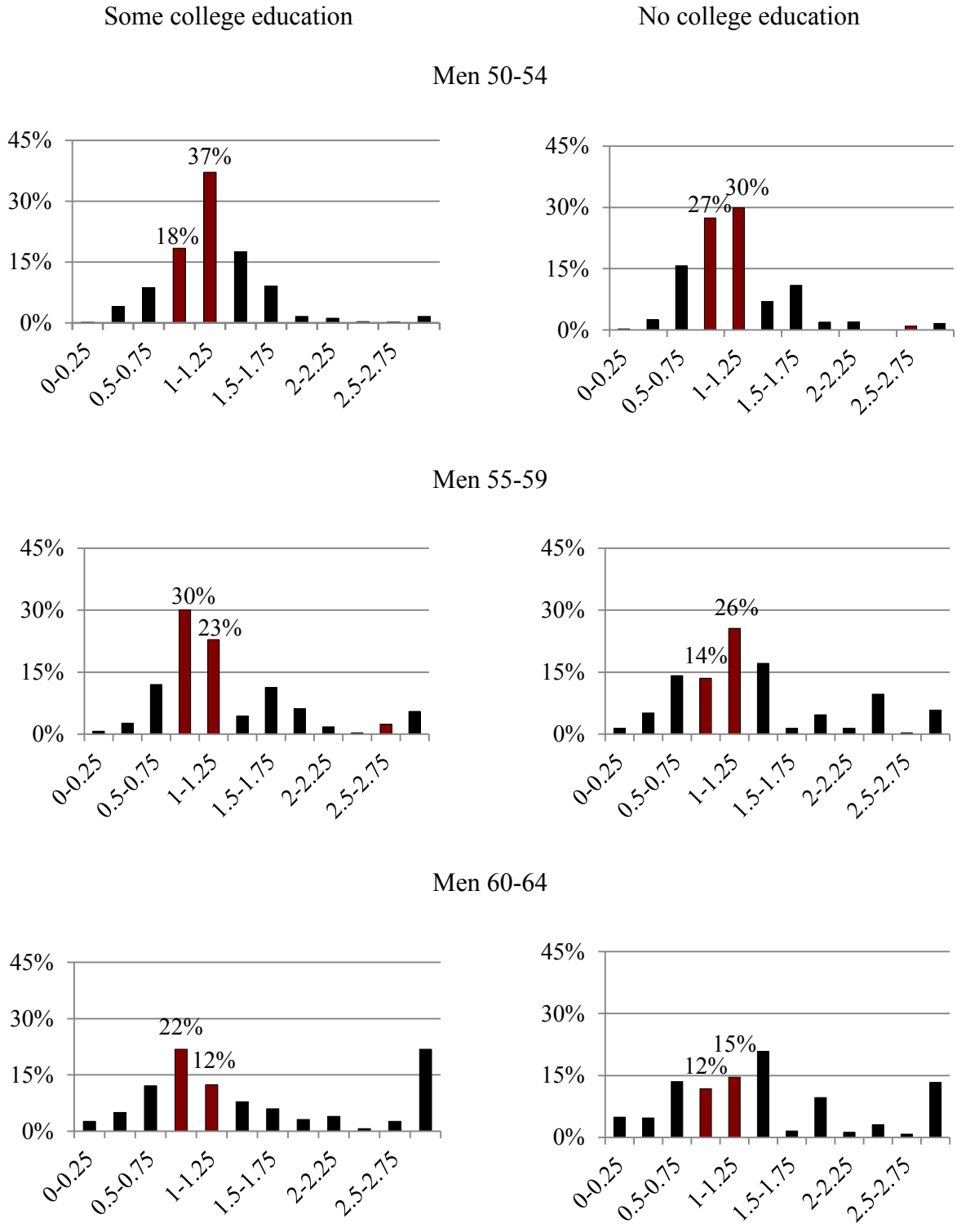
Note: * p<0.05; ** p<0.01; *** p<0.001.
Source: Current Population Survey Occupational Mobility and Job Tenure Supplements, 1996-2012.

Table A1. *Summary Statistics of Key Variables*

	Mean	Standard deviation
Occupational hiring ratio	1.06	0.63
Age 50-54	0.33	0.47
Age 55-59	0.33	0.47
Age 60-64	0.33	0.47
Female	0.50	0.50
Some college or more	0.55	0.50
Share with 15+ years of tenure	0.30	0.10
Turnover rate	0.30	0.27
Active learning	0.04	0.02
Communication skills	0.17	0.12
Judgment	0.26	0.10
Education	0.13	0.07
Experience and training	0.14	0.02
Social skills	0.12	0.10
Numerical ability	0.52	0.33
Computer skills	0.04	0.04
Dependability	0.57	0.30
Exposure to hazards	0.04	0.03
Working outdoors	0.09	0.06
Strength	0.12	0.07
Physical skills	0.17	0.09
10-year growth in employment	-0.00011	0.00090
Involuntary part time	0.09	0.06
Voluntary part time	0.12	0.14
Union coverage	0.15	0.13
Share of firms with < 24 employees	0.16	0.13
Share of firms with 25-99 employees	0.13	0.08
Real weekly earnings	598.5	263.0
Pension coverage	0.54	0.14
Unemployment rate	5.66	0.25
Occupational employment ratio	2.07	5.22
Sample size	1,704	

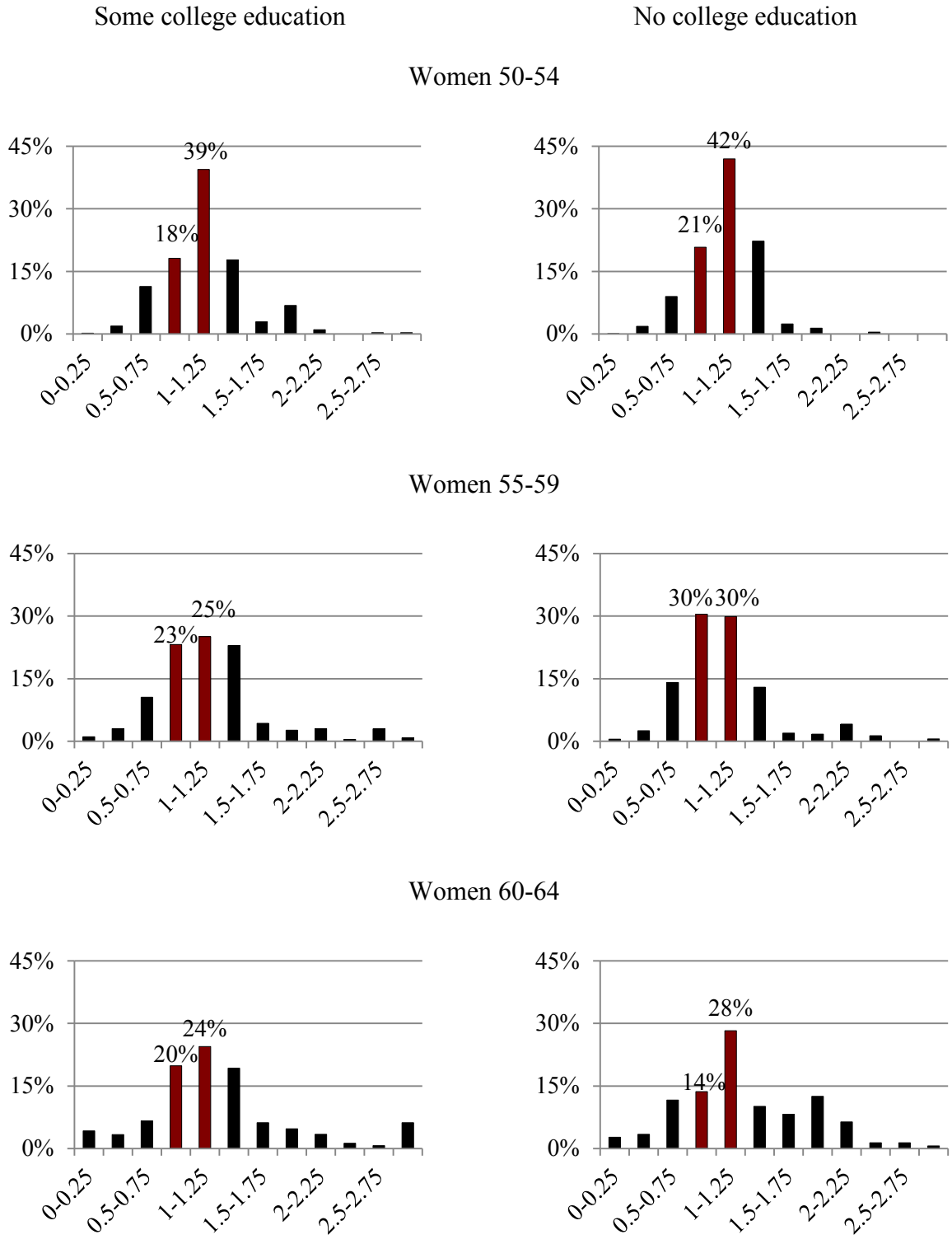
Source: Current Population Survey Occupational Mobility and Job Tenure Supplements, 1996-2012.

Figure 1. *Occupational Hiring Ratios for Older Men, By Age and Education*



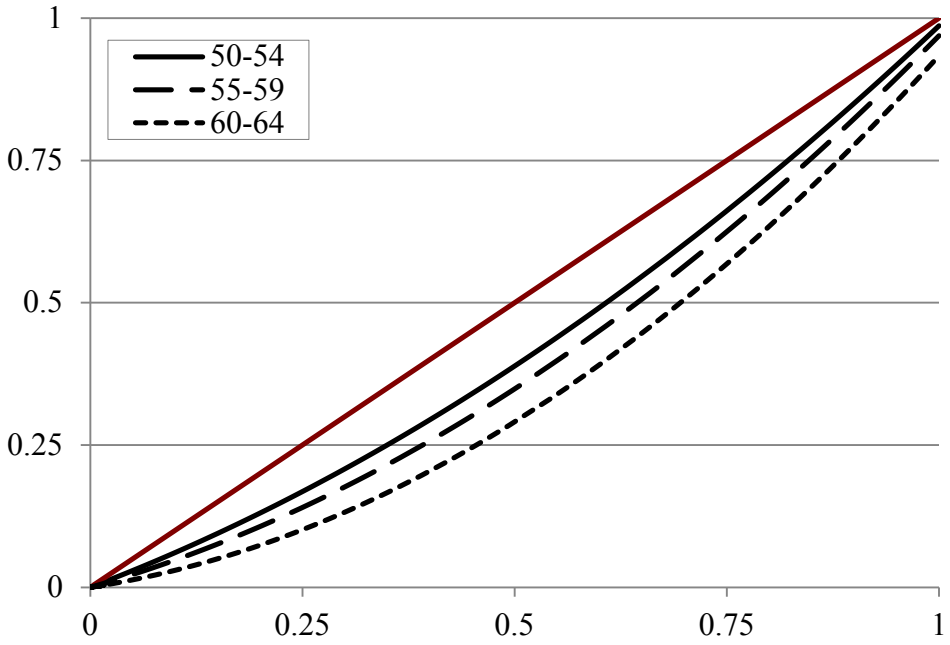
Source: Authors' calculations from 1996-2012 CPS.

Figure 2. *Occupational Hiring Ratios for Older Women, by Age and Education*



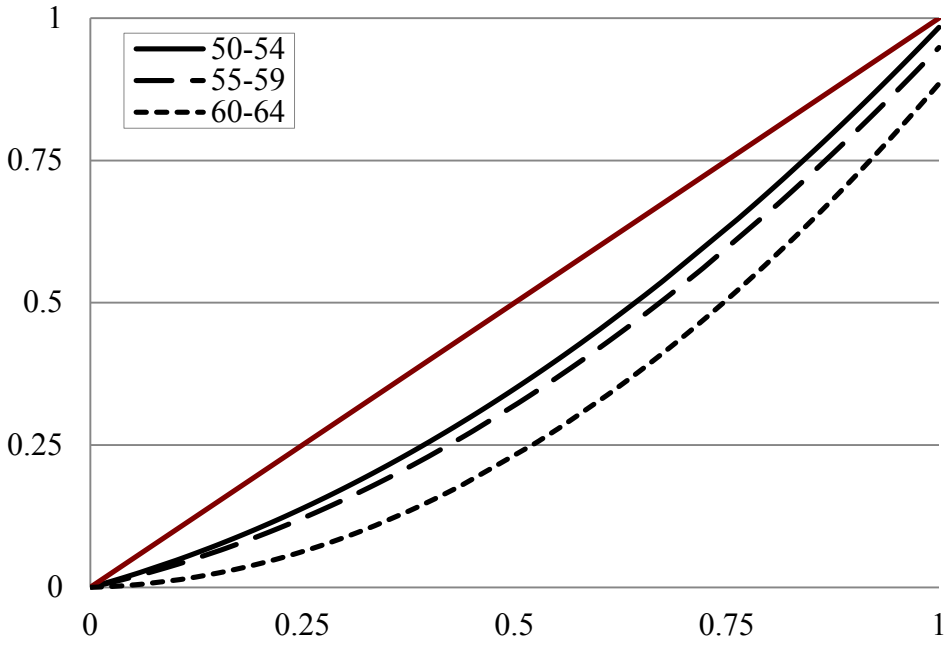
Source: Authors' calculations from 1996-2012 CPS.

Figure 3. *Lorenz Curves by Age Cohorts*



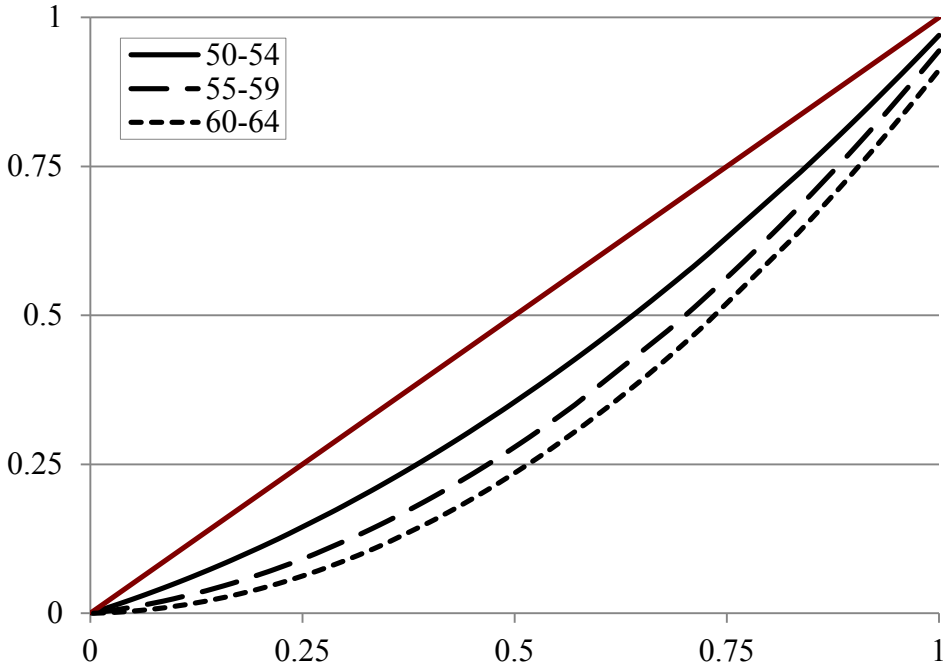
Source: Authors' calculations from 1996-2012 CPS.

Figure 4a. *Lorenz Curves for Better-Educated Men*



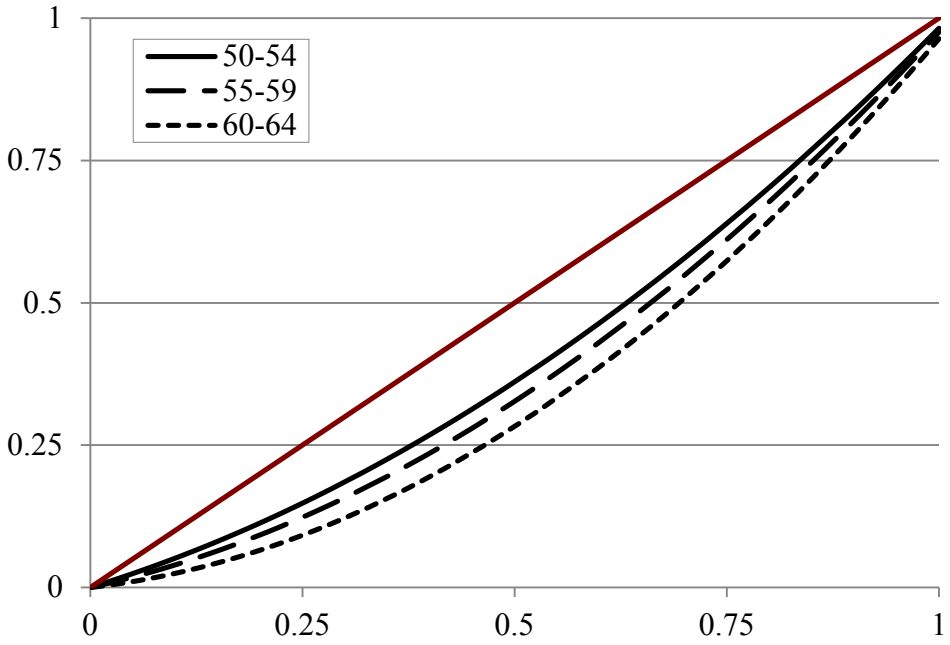
Source: Authors' calculations from 1996-2012 CPS.

Figure 4b. *Lorenz Curves for Less-Educated Men*



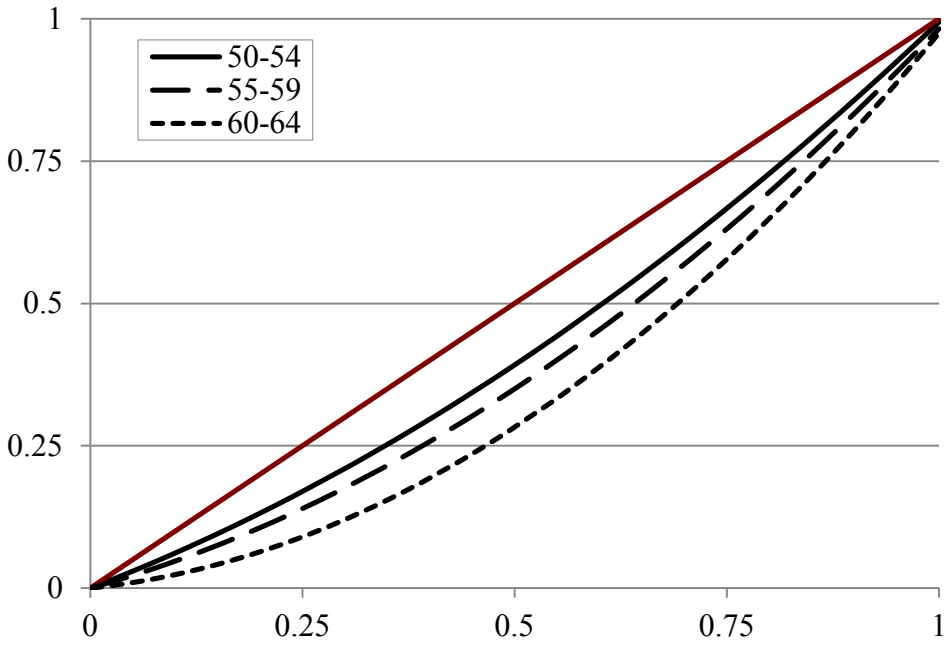
Source: Authors' calculations from 1996-2012 CPS.

Figure 5a. *Lorenz Curves for Better-Educated Women*



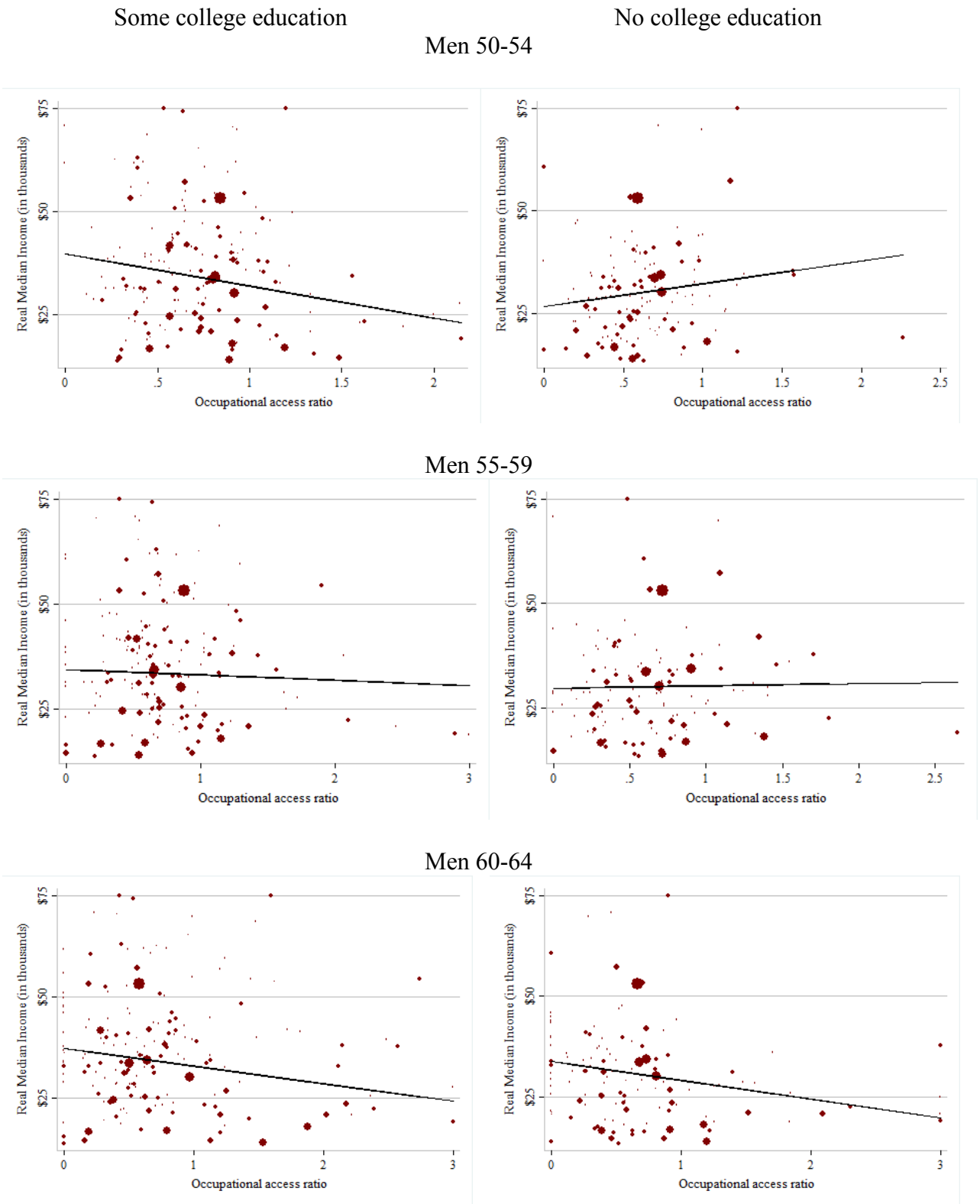
Source: Authors' calculations from 1996-2012 CPS.

Figure 5b. *Lorenz Curves for Less-Educated Women*



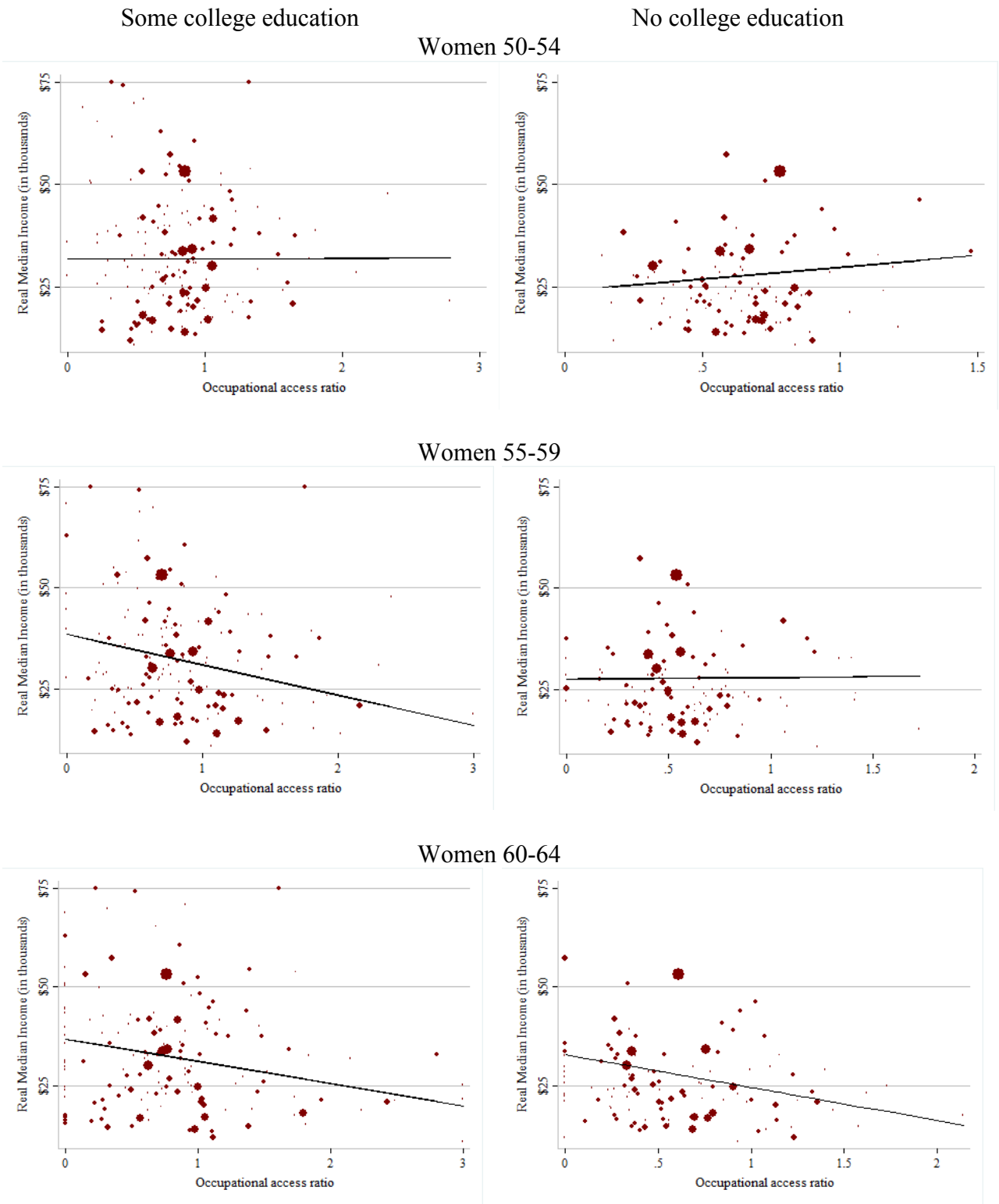
Source: Authors' calculations from 1996-2012 CPS.

Figure 6. *Occupational Hiring Ratios and Median Earnings for Older Men, by Age and Education*



Source: Authors' calculations from 1996-2012 CPS.

Figure 7. *Occupational Hiring Ratios and Median Earnings for Older Women, by Age and Education*



Source: Authors' calculations from 1996-2012 CPS.

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