HOW DOES OCCUPATIONAL ACCESS FOR OLDER WORKERS DIFFER BY EDUCATION?

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Abstract

Changing jobs after age 50 has become increasingly common. To assess the employment opportunities of older job-changers in the years prior to retirement, this study examines the how the breadth of occupations in which they find employment narrows as they age past their prime working years and how this differs by gender and educational attainment. The results indicate that workers who change jobs in their early 50s find employment in a reasonably similar set of occupations as prime-age workers, with opportunities narrowing at older ages. They also indicate that job opportunities broadened significantly for better-educated older workers since the late 1990s. While job opportunities now narrow significantly for less-educated men in their late 50s, this narrowing primarily occurs in the early 60s for women and better-educated men. Consistent with previous research, the study finds that employer policies that emphasize hiring from within create barriers to the hiring of older job-seekers; and that older workers are less likely to be hired in jobs requiring exposure to hazards. In contrast to earlier work, we find little evidence that computer use and numeracy requirements limit older workers' job opportunities. The study also finds that the narrowing of job opportunities is not associated with a general decline in job quality as measured by median occupational earnings. Occupations that disproportionately hire older workers pay less and an increasing share of older job changers find employment in such occupations. But enough older workers find employment in higher-paying occupations to keep the overall average largely unaffected.

Introduction

Job-changing after age 50 is increasingly common. The share of employed men ages 58 to 62 no longer working full-time with their age-50 employer rose from 30 percent in 1983 to 46 percent in 2008; 49 percent of employed women that age in 2008 had also changed employers since age 50.[1] The ability of older job-changers to find suitable employment affects not just their current income. It also affects their ability to remain employed long enough to secure an adequate retirement income.

One measure of the ability to find suitable employment is the range of occupations in which older job-seekers find jobs. A series of papers by Hutchens (1986, 1988, 1991, 1993) shows that employment opportunities for job-seekers age 55 and older were concentrated in a select set of occupations during the early 1980s. This study builds on Hutchens' research by investigating: 1) the extent to which job opportunities continue to be restricted for workers age 50 to 64 in a more recent period (1996-2012); 2) whether the extent of restriction differs by age and between better- and less-educated workers; and 3) how access changed between 1996 and 2012.

The results indicate that workers who change jobs in their early 50s find employment in a somewhat comparable set of occupations as prime-age workers. Job-changers in their early 60s, however, find employment in an increasingly narrow set of occupations. Less-educated men see their opportunities narrow even earlier: in their late 50s.

The results also indicate a change over time. At the beginning of the period under review, employment options were more restricted for better-educated older workers, relative to the options available to better-educated prime-age workers. Employment opportunities for older workers then generally expanded, especially for better-educated workers ages 55 to 64. Differences by education at any given age are now generally small, except for the difference between better- and less-educated men in their late 50s. Differences by gender are now much greater at all ages, with employment opportunities narrowing much more for men as they age past their prime working years.

The analysis then identifies labor market characteristics associated with the narrowing of employment opportunities. Confirming earlier findings in Hutchens (1986, 1988) and Hirsch, Macpherson, and Hardy (2000), it finds "internal labor market" policies that respect seniority and promote from within create significant barriers to entry for older job-seekers, though these

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

practices seem less important than in the past. The analysis also confirms results reported in Hirsch et al. (2000) that jobs exposing workers to hazards reduce the hiring of older job-changers. But unlike Hirsch et al. (2000), the study finds no evidence that computer use or numerical skills are significant hiring limitations.

Finally, the study considers the consequences of this narrowing of employment opportunities, using median occupational earnings as the yardstick for job quality. An increasing share find employment in occupations that disproportionately hire older workers and pay substantially lower wages, indicating the high cost of the narrowing of employment opportunities for an increasingly large subset of older job-changers. But this increase in "older," lower-paying occupations is offset by a (smaller) increase in older workers hired in "younger," better-paying occupations, while fewer older workers find jobs in occupations hiring relatively equal shares of older and prime-age workers. Overall, therefore, the earnings analysis suggests relatively little reduction in overall job quality for workers changing employers in their 50s.

Previous Literature

The study of older workers' job opportunities begins with Hutchens (1986, 1988, 1991, 1993), who finds that the older job-changers found employment in relatively few occupations, with most occupations hiring very few older workers. 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 are associated with long tenures, high wages for older workers, DB pensions, and mandatory retirement, which Hutchens uses 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 access to employment by older job-seekers. Hirsch, Macpherson, and Hardy (2000) provide additional evidence that internal labor markets created significant impediments to the employment of job-seekers age 50 and over through most of the 1990s. They also find occupations that require extensive training, computer use, numerical aptitude, 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. Other researchers find age discrimination also reduces hiring opportunities (Lahey 2006; Neumark and Song 2013). Adler and Hilber (2009) finds that job-seekers ages 55 to 64 in 2005 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). Older workers are also much better educated than they were in the 1980s and are no longer less educated than younger workers (Munnell and Sass 2008). Educated job-seekers, who possess more generic human capital and longer expected work-lives, should be more attractive to employers. Older workers also make up a much larger share of the labor force. After the first Baby Boomers turned 50, in 1996, the ratio of workers under age 50 to those over age 50 fell from 4:1 in 1995 to 2:1 today. Older workers likely account for a greater share of supervisors and human resources professionals who make the hiring decisions, and are likely to be more favorably disposed toward older job candidates than younger supervisors and HR professionals (Munnell, Sass, and Soto 2006). 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). While displaced older 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, workers are also retiring later, suggesting that older job-changers are finding "suitable" employment opportunities (Munnell 2015).

This study extends the Hutchens-style analysis in several directions. It only examines job-changing by workers age 50 to 64, assessing employment opportunities prior to the traditional retirement age of 65; this departs from Hutchens, Hirsch et al., and Johnson and Kawachi, which assess re-employment opportunities for all older workers – even those well past conventional retirement ages. Second, it tests the hypothesis that hiring opportunities narrow with age and are increasingly concentrated in low-paying occupations. Third, it examines the

effect of gender and education, testing the hypotheses that opportunities decline at a different pace for older job-changers that differ by education and gender. 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 changes 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 occupational employment opportunities narrow as job-changers age past their prime working years, defined as ages 30 to 49, and how this varies by educational attainment and gender. The basic unit of the analysis is the occupation. Over the period under review, we count up the number of workers hired in that occupation by age, education, and gender. We also collect occupational characteristics, including compensation, turnover and tenure, required skills, and work conditions, to identify factors associated with changes in occupational access.

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 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, the greater the likelihood the worker changed jobs within that employer. To reduce this source of error in identifying hiring

by occupation, the analysis restricts the sample to workers hired within the five years that preceded the job tenure supplement.[2]

The sample is divided by education and gender, with educational attainment split between workers who have, or don't have, at least some college experience. This divides the sample into four roughly equal gender and education sub-groups. We identify hiring using 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. Three-digit occupations that do not have 20 prime-age hires are aggregated at the two-digit level. For example, if 24 less-educated prime-age men were hired as messengers, a three-digit occupation, across the years surveyed, messengers would be included in the sample without further aggregation. If only nine less-educated prime-age men were hired as postal clerks and 11 as mail clerks outside the postal service, these two occupations, with 20 prime-age hires, would be combined at the two-digit level as "mail and message distributing occupations, not elsewhere classified."

When the sample is divided by gender and education, it has 2,172 gender- and education-specific occupation cells, compiled from 319 unique occupations with a sufficient number of prime-age hires. This sample includes 84 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 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, 2002-2006, and 2008-2012). For example, only 233 occupations have enough prime-age better-educated men to be included in the sample for better-educated older workers; these 233 occupations, however, account for about 62 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-

[2] Hutchens (1988, 1991) and Hirsch et al. (1999) also use a five-year window. The age of hiring is the worker's age less their tenure with their employer, and their current occupation is assumed to be the occupation in which they were hired.

time voluntarily, and part-time involuntarily; median employer size; and the proportion with a pension and in a union.[3] The *Occupational Mobility and Job Tenure* supplement also provides information on the share of workers in the occupation with lengthy tenures, defined as 15 or more years of tenure, and the turnover rate, defined as the share of workers with less than five years of tenure. This information is used to identify employer personnel policies that may restrict employment opportunities for older job-seekers, 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 scores for the importance of a particular skill and the level of skill required. We calculate the product of the two scores for 59 skills, organized into 14 categories: active learning, communication, judgment, education, experience, training requirements, working outdoors, social skills, math skills, strength, physical skills, computer skills, dependability, and exposure to hazards.[4]

Methodology

To assess the extent to which employment opportunities narrow, the project compares the share of older job-changers to the share of prime-age job-changers 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 personal practices, skill requirements, and working conditions. Finally, we compare earnings in occupations with large and small share of older workers as a measure of the effect of occupational access on the quality of employment opportunities available to 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 job-changers hired in occupation *j* to the share of prime-age job-changers hired in occupation *j*:

[3] DB pension coverage is a useful indicator of internal labor markets cited by Hutchens and Hirsch as an important barrier to the employment of older job-seekers. The CPS, however, does not specify whether pensions are DB plans or defined contribution (DC) plans.

[4] The two scores – importance and level of skill required – are both normalized to have them vary over a range from 0 to 1. While the O*NET database includes scores for thousands of minutely-defined skills, we use only 59, aggregated into these 14 categories.

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

$\frac{HireOld_j}{\sum_j HireOld_{j_j}}$ is the share of older workers hired over the past five years in occupation *j* as a percent of older workers hired in all occupations. $\frac{HirePrime_j}{\sum_j HirePrime_j}$ is the share of prime-age workers hired in occupation *j*. For example, assume 3 better-educated women age 50-54 were hired as veterinarians out of 2,995 college-educated women that age hired in all occupations combined. Veterinarians thus make up 3/2995 = 0.10 percent of the workers hired in this age-education-gender group. Assume 24 prime-age better-educated women were hired as veterinarians, or 0.11 percent of 20,967 prime-age workers hired 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 1996-2012 and the sub-periods 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 hired in the occupation in the same period, with at least 20 prime-age hires for each occupation included in the analysis.

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 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 job-changers who find employment in occupations with occupational hiring ratios in a given range, such as .75 to 1.25.[5]

Following Hutchens (1991), we also use occupational hiring ratios to construct Lorenz Curves and calculate Gini coefficients that indicate the concentration of job opportunities in a subset of occupations as workers age.[6] In this analysis, occupations are sorted according to their hiring ratios, from low to high. The Lorenz Curves then plot the cumulative share of older workers hired on the y axis and the cumulative share of prime-age workers hired on the x axis. 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 is the ratio of the area between the Lorenz Curve and the 45-degree line to the entire area below the 45-degree line. The greater the concentration of hiring, the greater the gap between the Lorenz Curve and the 45-degree line, and the greater the Gini coefficient. The study calculates the Gini coefficient 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 and the fitted curve.[7] Gini coefficients are calculated separately for each age group and by gender, education, and time period.

The histograms show the share of workers hired in occupations within a given range of hiring ratios. The share of workers hired in occupations with hiring ratios between 0.75 and 1.25 indicate the persistence of job opportunities, as it indicates the share of workers hired in occupations that hire approximately equal shares of older and prime-age job-changers. If access narrows, this "persistence share" will fall and Gini coefficient will rise. We use these measures to test whether employment opportunities narrow at a faster pace as job-seekers age; whether occupational access evolves differently by gender and educational attainment; and whether these patterns have changed over time.

[5] We do not use CPS-provided weights, because the analysis stacks together multiple years. The regression analysis uses weights constructed from the number of respondents in the occupation.

[6] Lorenz Curves are most commonly used to assess income and wealth inequality. See Kennickell (2009) for a survey.

[7] 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.

The project also identifies factors associated with differences in occupational access by estimating regressions using occupational hiring ratios as the dependent variable.[8] The explanatory 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 and the turnover rate (the ratio of hires to all employees); 2) the importance of specific skills based on the O*NET variables; 3) macroeconomic indicators of labor market strength; 4) indicators that previous research suggests reflect worker preferences: the share of the occupation's workforce that works part-time and typical working conditions; 5) the importance of other institutional structures, such as median firm size and the share of the occupational workforce that is unionized; 6) compensation, including the log of median occupational earnings and the share with pension coverage (DB and DC combined);; ; and 7) age, education, and gender, to examine how occupational hiring ratios vary by these characteristics. 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 is similar to measures 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 – to 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 median occupational earnings as the measure of occupational quality. We use the weighted average of median earnings in occupations where prime-age workers find employment as a benchmark for assessing the quality of occupations that disproportionately hire older workers and occupations that hire relatively equal shares of older

[8] 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.

and prime-age workers. The hypothesis is that the narrowing of employment opportunities results in older workers finding employment in occupations that disproportionately hire older workers (i.e., have hiring ratios substantially greater than one), and that these occupations pay less than occupations where hiring opportunities are reasonably persistent with age. We also test this hypothesis by estimating a regression of the relationship between an occupation's median earnings and its hiring ratio.

Results

The key variable in the analysis is the occupational hiring ratio, which is used to measure the degree to which employment opportunities across occupations become more limited as workers age past their prime working years. The analysis first plots histograms of hiring ratios for older job-changers by gender, education, and age. It then lists occupations where hiring is more and less accessible to older workers, and the largest occupations where access is similar to that of prime-age workers. Next, we quantify the degree to which hiring is concentrated using Gini coefficients, and examine how this measure has changed over time. We then estimate regressions that identify the factors associated with employment opportunities. Finally, we determine whether occupations favorable disposed toward older hiring are less desirable using median earnings as an indicator of desirability.

Employment opportunities narrow with age. Figure 1 displays the histogram of this ratio 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 in their early 50s, just over half are hired in occupations that hire a similar share of prime-age job-changers. While some hiring occurs in occupations that disproportionately hire older workers, as identified in earlier studies, only 5 percent are in occupations with hiring ratios greater than 2.

At older ages, hiring increasingly shifts to occupations that disproportionately hire older workers. The share of better-educated men in their late 50s hired in occupations with ratios near one is 43 percent, down somewhat from the share in their early 50s (58 percent). For less-educated men ages 55-59, this share falls even further, to 39 percent, indicating a greater narrowing of hiring opportunities for less-educated men in their late 50s than for better-educated men. In their early 60s, however, similar shares of better- and less-educated men are hired in occupations with hiring ratios greater than 2 – 29 and 32 percent, respectively.

Figure 2 repeats this analysis for women. Nearly two-thirds of women in their early 50s are hired in jobs with relatively equal opportunities for older and prime-age workers, an even greater share than men at these ages. In their late-50s, women in both education groups have fairly stable employment prospect. The proportion of better-educated women hired in occupations with a hiring ratio near 1 falls only from 67 percent to 52 percent. While the share of less-educated women in occupations with hiring ratios near one falls from 69 percent to 32 percent, it is *not* because they are increasingly finding jobs in occupations that disproportionately hire older workers. In fact, the proportion of less-educated women in occupations hiring more prime-age workers increases substantially, from 8 percent in occupations with hiring ratios of less than 0.75 to 54 percent. At ages 60-64, however, about 40 percent of better-educated women and 26 percent of less-educated women are hired in occupations with a ratio exceeding 1.25, including about 10 percent in excess of 2 for both groups. Overall, however, opportunities decline less for women than men as they age past their prime working years.

More and less accessible occupations for older job-changers. What kinds of jobs are most open to older workers as they age, which are most closed, and which are relatively indifferent to the age of the job-seeker? Table 2 lists the top five and bottom five occupations, ranked by hiring ratio; this ranking includes all occupations in which at least two older workers in the sample are hired in each group. Some of the occupations identified in Hirsch et al. (2000) that tend to skew older appear in this list, including tailors, taxi drivers, guides, and protective services. Only older workers are left to fill vacancies in occupations in long-term decline, such as farmers and mail handlers. Sales demonstration, on the other hand, is a growing occupation apparently suited to older workers.

Among the occupations listed that rarely hire older workers, fire fighters and postal clerks display internal labor market characteristics, such as long tenures and enforced or encouraged early retirement on DB pensions; if workers in these occupations want to prolong their careers, they may have to do so in less physical or stressful alternatives like private security or message delivery – occupations that tend to skew older. Other occupations listed that rarely hire older job-changers require workers to keep up with improving technology, such as data processing repair and auto mechanics. Some have physical demands, such as roofers and welders. Hiring in the medical professions listed – including dentistry and physical therapy – could also reflect recent employment growth and a dearth of older workers in the field.

Measuring the concentration of older hiring by occupation. The Lorenz curves in Figure 3 for the three age groups – ages 50-54, 55-59, and 60-64 – provide further evidence of narrowing job opportunities as workers age. The Lorenz curves move further from the 45-degree line with age, indicating an increasing concentration of hiring in a smaller number of occupations.

The Gini coefficients in the first three rows of Table 3 quantify the increasing concentration of hiring particular occupations as workers age. At ages 50-54, the Gini coefficient is 0.15, a level that is low, but statistically distinct from zero.[9] The Gini rises – and the concentration of hiring increases – to 0.22 at ages 55-59 and to 0.31 at 60-64. The confidence interval around each Gini is compact, so each increase is statistically significant.

Figures 4 and 5 plot Lorenz curves for men and women, respectively, by education level. Table 3 reports the Gini coefficients for each Lorenz curve. The Lorenz curves and Gini coefficients show similar trends: hiring concentration rises with age in all four worker groups. Among men, the narrowing of employment opportunities occurs sooner for those with less-education: between ages 50-54 and 55-59, the Gini rises from 0.21 to 0.29 for more-educated men, but from 0.21 to 0.32 for less-educated men. But by ages 60-64, the concentration of hiring is similar for men in both of the educational groups. Hiring opportunities narrow less for women, and especially for less-educated women in their 50s. At ages 60-64, however, the concentration of hiring becomes similar for women in both of educational groups. However, hiring opportunities are clearly more limited for men in their early 60s, relative to opportunities for prime-age men, with Gini coefficients of about 0.4, as opposed to 0.3 for women that age.[10]

Hiring concentration over time. Table 4 reports Gini coefficients for each subgroup across three different time periods – 1996-2000, 2002-2006, and 2008-2012.[11] The Gini coefficients generally declined over time, indicating a broadening of employment opportunities for older job-changers.

In the late 1990s, Gini coefficients were larger for men than for women, and while men's Ginis are similar by education, less-educated women had lower Gini coefficients at each age than

[9] 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).

[10] 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.

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

more-educated women. Furthermore, the age pattern differed by gender: while Ginis increased with age in lockstep for better- and less-educated men, employment opportunities narrowed more quickly for better-educated women than for their less-educated counterparts.

By the late 2000s, however, Gini coefficients had fallen for all groups except less-educated men in their late 50s. In contrast, better-educated men saw across the board improvement in the breadth of employment opportunities. As a result, the Ginis of better- and less-educated men are similar at 50-54 and 60-64, but employment opportunities are much narrower for less-educated men at ages 55-59.

Compared to men, women saw much larger decreases in Gini coefficients between the late 1990s and late 2000s. Job opportunities for better-educated women especially improved, almost closing the gap with less-educated women in each age group.

The general trend toward broader occupational employment opportunities differs from the results reported in Hirsch, et al. (2000). That study finds little improvement, albeit over an earlier time period and for a population of "older workers" that includes individuals age 65 and over, many of whom presumably find employment in "retirement jobs." The broadening of opportunities is consistent with a decline in the importance of internal labor markets. That the broadening of opportunities was largely concentrated among better-educated workers is also consistent with the well-documented increase in earnings inequality and a skill-biased shift in labor demand. That better-educated workers are the primary beneficiaries of changes in the labor-market for older workers suggest that they reflect a shift to a more fluid, knowledge-based economy, with generic human capital – which better-educated workers tend to possess – becoming increasingly important relative to firm-specific human capital employers developed and retained using internal labor market policies.

Identifying the correlates of occupational access. 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 adds the occupational employment ratio as a control for labor supply.

Two variables seek to identify the relationship between internal labor markets and hiring ratios: occupational turnover rates and the incidence of long tenures. Both turnover rates and the proportion of an occupation's workforce with tenure of 15 years or longer are associated with

lower hiring rates – meaning less hiring of older workers. The effects, however, are both small: a 10-percentage-point increase in the share of long-tenured workers is associated with a statistically significant 0.09-percentage-point decrease in the hiring ratio, and the effect is even smaller for the turnover rate. The precise, but small, magnitude of these estimated relationships could reflect a weakening of internal labor markets as a barrier to the employment of older job-seekers or in the relationship between internal labor markets and long-tenured employment.

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 are associated with more hiring of older workers. The evidence that numerical ability, cognitive flexibility (as seen in "active learning"), 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 occupational hiring ratio also does not differ by how much employers in that occupation engage in on-the-job training or value on-the-job experience; while these factors could hinder older workers who have less remaining time in the workforce to benefit from human capital investment, the regression suggests that these factors do not reduce older hiring.

Employment growth in an occupation over the previous 10 years is associated with a minuscule, albeit statistically significant, increase in hiring ratios. Hirsch et al. (2000) likewise find no evidence of a relationship between occupational employment growth and hiring ratios. The negative and statistically significant estimate on the national unemployment rate indicates that when the labor market is weak, employers are less likely to higher older workers relative to their prime-age counterparts.[12]

Hiring ratios may also reflect worker preferences, with older workers seeking jobs with particular characteristics. Hirsch et al. (2000) found evidence that older women seek part-time employment, raising hiring ratios in occupations characterized by significant part-time work. Our results, which do not include workers age 65 and older, find no such relationship between hiring ratios and voluntary part-time work. Jobs with high involuntary part-time work, in contrast, are associated with less hiring of older workers, though this finding likely does not reflect worker preferences. Like Hirsch et al. (2000), working outdoors is associated with more hiring of older workers, but unlike Hirsch et al., physical skills are also associated with more

[12] On the other hand, easily the highest national unemployment rates observed in the data occur in the 2008-2010 period, when the occupational hiring ratio is at the end of its secular decline, so the unemployment coefficient may be picking up some of the downward trend in the hiring ratio.

hiring of older workers. This finding may be evidence of a skill shortage in the trades, or more evidence that job polarization has reduced opportunities in jobs requiring routine tasks; Autor and Dorn (2009) suggest that younger workers have mostly left these kinds of jobs, increasing the average age of workers in jobs whose tasks are mostly routine. Exposure to hazards, however, has a statistically significant relationship with hiring ratios in the other direction. Unlike Hirsch et al. (2000), which finds a positive relationship between hazards and occupational hiring ratios, our results find a smaller share of older than prime-age workers hired in occupations that involve such exposure.

Our results also find no difference in the likelihood that older workers are hired in occupations that are heavily unionized as opposed to occupations with little union coverage. This differs from Hirsch et al. (2000), which finds union jobs are less available to older workers. Our result could reflect the shift in the composition of union membership from industrial unions, in industries such as autos and steel that are characterized by long tenures with a single employer, to craft unions, in industries such as the building trades that often involve relatively short tenures with a succession of employers. The study also finds firms with 25-99 employees are less likely than firms with 100 or more employees to hire older workers, 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, pension coverage is associated with a statistically significant increase in hiring ratios. This is quite different from the findings reported in Hutchens (1988) and Hirsch et al. (2000). Those studies used DB pensions as an internal labor market indicator, and found it was associated with a significant reduction in the employment of older job-seekers. Today, most pension plans are 401(k)s, which are not an instrument employers use to manage internal labor markets based on career employment and do not make older workers more expensive for employers to hire.[13] Labor-market matches are thus more likely to reflect worker preferences, and older workers – for whom retirement saving is more salient – are more likely to seek out jobs with pension coverage.

When we control for labor supply using the occupational employment ratio, the share of older workers employed in the occupation, the relationship between hiring ratios and the other variables tested is essentially unaffected. The coefficient on the occupational employment ratio

[13] The CPS does not distinguish between defined benefit and defined contribution pension plans.

itself is statistically significant, but the relationship is weak: a doubling of the mean occupational employment ratio would be associated with only a 0.04-percentage-point increase in the occupational hiring ratio. This weak result indicates either that the occupational employment ratio is a poor proxy for labor supply, or that labor demand drives most of differences in hiring of older workers.

The regression also tests whether the occupational hiring ratio differs by age, gender, and education. The interpretation of these coefficients differs somewhat from the earlier discussion of Gini coefficients. The regression examines whether individual occupations, on average, hire more or fewer older workers relative to prime-age workers. Gini coefficients, in contrast, are measures that take into account the full market for workers categorized by age, gender, and education *across* occupations, not just the status of each occupation separately. The regression coefficients are consistent with the Gini analysis: hiring ratios rise with age and are lower for the less-educated, though none of these estimates are statistically significant. Being a woman, all else equal, is associated with a reduction in hiring ratios, which is consistent with Gini coefficients that are consistently lower for women.[14]

Overall, the results suggest that occupations that hire a greater share of older workers are lower-paying and require greater use of communication skills. Internal labor markets are still somewhat of an impediment – some occupations may hire fewer older workers because they value long-tenures – but the decline of union power and the transition away from defined benefit pensions have likely reduced the restrictions faced by workers looking to enter an occupation in late-career, which helps to broaden employment opportunities at older ages.

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. To test whether this is the case, the study uses median occupational earnings as an indicator of the occupation's quality. It uses the average earnings in occupations where prime-age workers find employment – $553 a week in 2010 dollars, as indicated in Table 6 – as the benchmark for assessing the quality jobs in which different groups of older workers find employment.[15]

All entries in Table 6 include the same set of occupations, but with different weights that reflect the extent to which each group of job-changers is hired in each occupation.[16] The top

[14] The regression estimates line up with the mean and median occupational hiring ratios in Appendix Table A2.
[15] Results using only the median weekly wages among prime-age workers are almost identical to these results.
[16] Zero is a possible weight; for example, 100 waiters are hired prime ages, but no college educated women age 60-64 are hired as waiters.

panel of Table 6 indicates that older and prime-age workers find employment, on average, in occupations that pay much the same weekly wage. Average occupational earnings are relatively constant with age, which suggests that the narrowing of occupational opportunities with age is not associated with a general decline in job quality.

The middle panel of Table 6 focuses on occupations that hire disproportionate shares of older workers. As workers age, more are hired into such occupations: from 20 percent at age 50-54 to 43 percent at 60-64. These occupations tend to be lower-paying than occupations that hire prime-age workers, and that gap increases with age. At ages 50-54, the typical worker in this group finds employment in occupations that pay 7 percent less than the occupations that hire the typical prime-age worker; the gap increases to 15 percent at ages 55-59 and to 17 percent at ages 60-64. By contrast, the set of occupations that hire relatively equal shares of prime-age and older workers age 55-59 and 60-64 actually pay more than the occupations that hire the typical prime-age worker (third panel), and the occupations that hire prime-age workers disproportionately are even better-paying (lowest panel). This finding echoes the results from the Gini analysis, which indicated an increase in dispersion of job opportunities with age. In particular, the results in Table 6 suggest that this increasing dispersion pushes an increasing share of older hires into lower-paying occupations, with other older workers finding employment in higher-paying occupations and the overall average largely unaffected.

Figure 6 plots the relationship between the occupational hiring ratio among men by age and educational attainment and that occupation's median earnings, and fits a linear regression line to the data. All of the lines in the left column of Figure 6 are downward sloping and statistically significant, so that a higher occupational hiring ratio is associated with lower earnings for better-educated men, suggesting that older workers may miss out on some of the better-paying jobs. The line for better-educated men ages 50-54 indicates that an occupation hiring twice as large a share of older workers as prime-age workers pays 22 percent less than occupations hiring equal shares of older and prime-age workers. The line for better-educated men ages 60-64 indicates a 17 percent decline in median earnings from a ratio of 1 to a ratio of 2.

For less-educated men under 55, the fitted line is positive but statistically insignificant. But the pattern for less-educated 55-64 year old men is similar to that for their better-educated counterparts: the slope of the fitted line is negative, though statistically significant only at ages 60-64. Occupations hiring twice as large a share of better-educated men age 60-64 as prime-age workers have 13 percent lower median earnings than occupations with a hiring ratio of 1.

Figure 7 repeats this exercise for women. The lines are statistically significant for better-educated women in each age group, but statistically insignificant for less-educated women in each age group. Compared to occupations hiring equal shares of older and prime-age workers, occupations with a hiring ratio of 2 among better-educated women age 50-54 pay 23 percent less than occupations hiring relatively equal shares of older and prime-age workers; the same figure is 30 percent less among better-educated women age 55-59, and 24 percent less for this group at ages 60-64. These reductions are larger than those identified for older men. 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 could be greater for women. These results also emphasize how costly restricted hiring at older ages can be for both men and women, particularly for the better-educated.

Conclusion

A generation ago, older workers approaching retirement were unlikely to change jobs. Today, nearly half of all workers change jobs in their 50s. The availability of employment opportunities for such job-changers has become increasingly important as workers need to extend their careers to compensate for falling Social Security replacement rates and the decline of DB pensions.

The paper updates research on the previous generation of older workers, primarily Hutchens (1986, 1988) and Hirsch et al. (2000), by focusing on job-changing between the ages of 50 and 64, and examining how the evolution of employment opportunities differs by gender and educational attainment. We find that workers in their early 50s have relatively similar job opportunities as prime-age workers, but the occupations available to older job-seekers thereafter narrows for both better- and less-educated workers. In the late 1990s, better-educated workers saw their occupation choices decline more rapidly with age than less-educated workers. Occupations have since become more open to older job-changers, with better-educated workers the primary beneficiaries and less educated men in their late 50s the primary exception. By the end of the period under review, access to occupations narrowed significantly for less-educated men in their late 50s – but not until the early 60s for better-educated men and for women in both education groups. The main divide in occupational access became gender, not education: men saw their employment opportunities narrow more as they aged past their prime-working years –

with this difference primarily driven by the difference in occupational access between less-educated men and women.

The results confirm earlier findings that the narrowing of occupational opportunities is associated with the presence of internal labor markets, though its importance has weakened with the decline in union power and the transition away from defined benefit pensions. In contrast to earlier work, we find little evidence that computer use and numeracy requirements limit older workers' job opportunities.

The results also reject earlier notions that the narrowing of employment opportunities is associated with a general decline in job quality, as indicated by median occupational earnings. Occupations that disproportionately hire older workers do pay substantially lower wages than occupations that hire relatively equal shares of older and prime-age workers or that disproportionately hire prime-age workers, with the share of job-changers finding employment in "older" occupations rising sharply with age. But enough older workers find employment in "younger," higher-paying occupations to keep the overall average largely unaffected.

These results should be interpreted with caution. Most importantly, the sample included only job-seekers that 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 less-educated older job-seekers.

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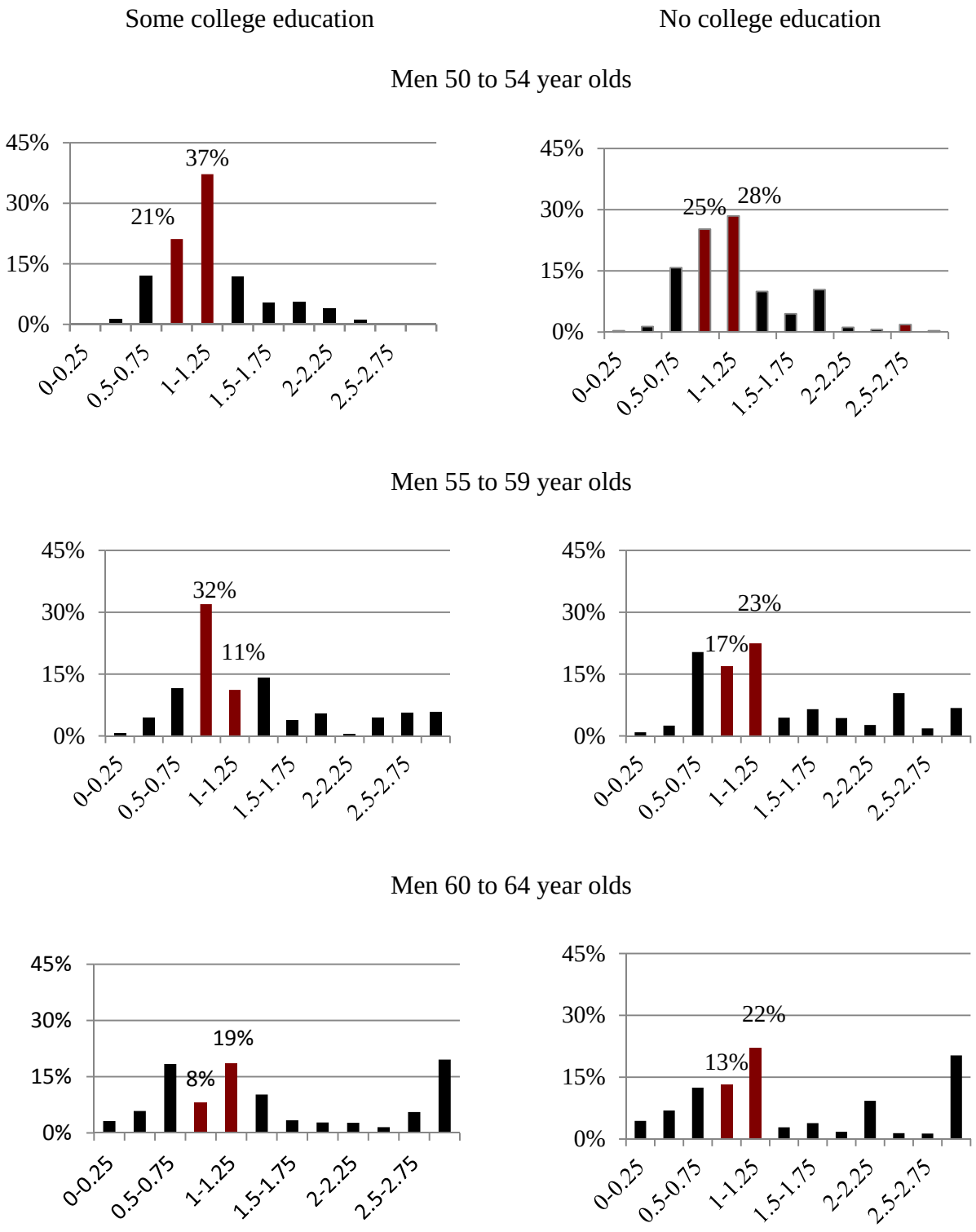
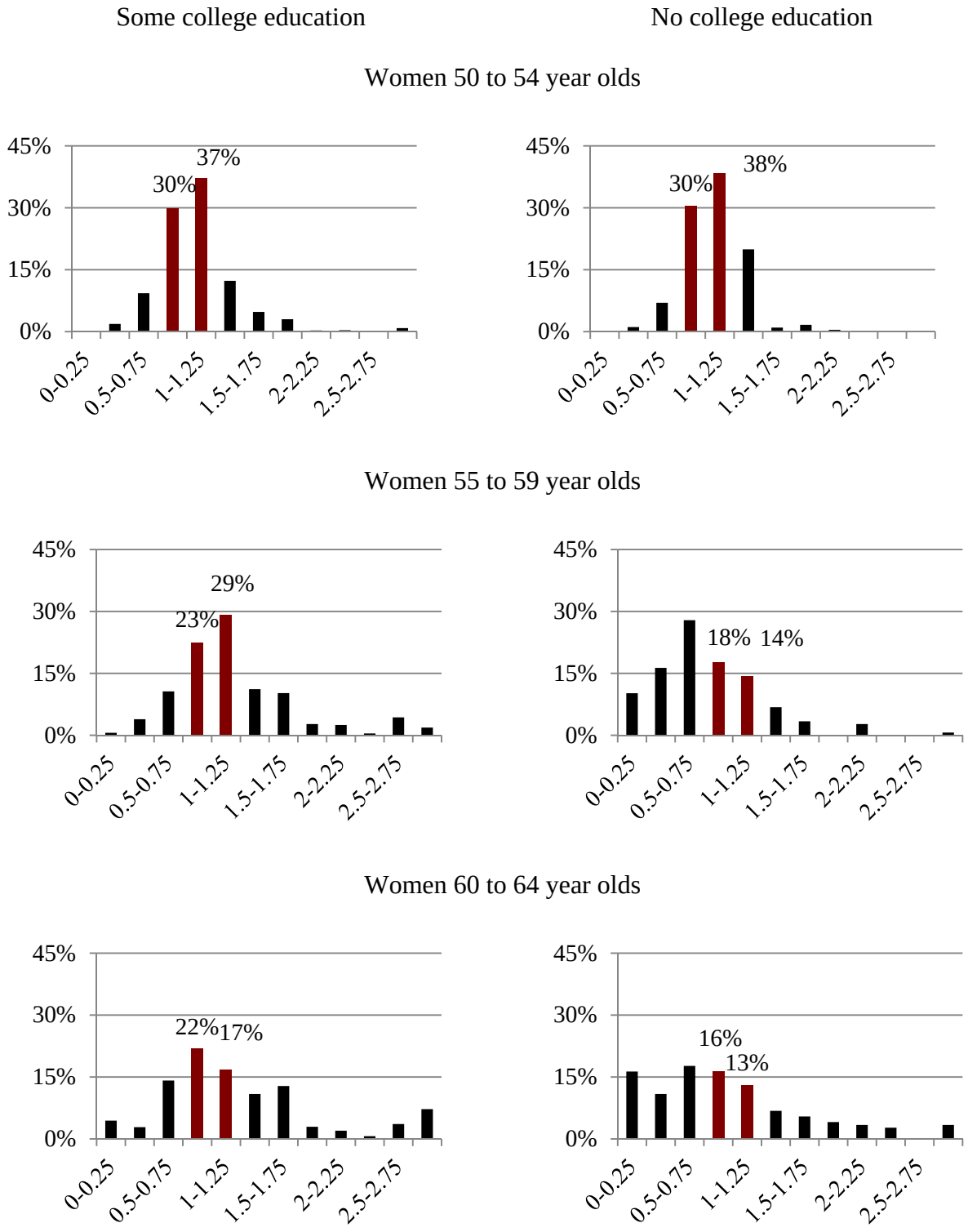
Figure 1. *Occupational Hiring Ratios for Older Men, By Age and Education*



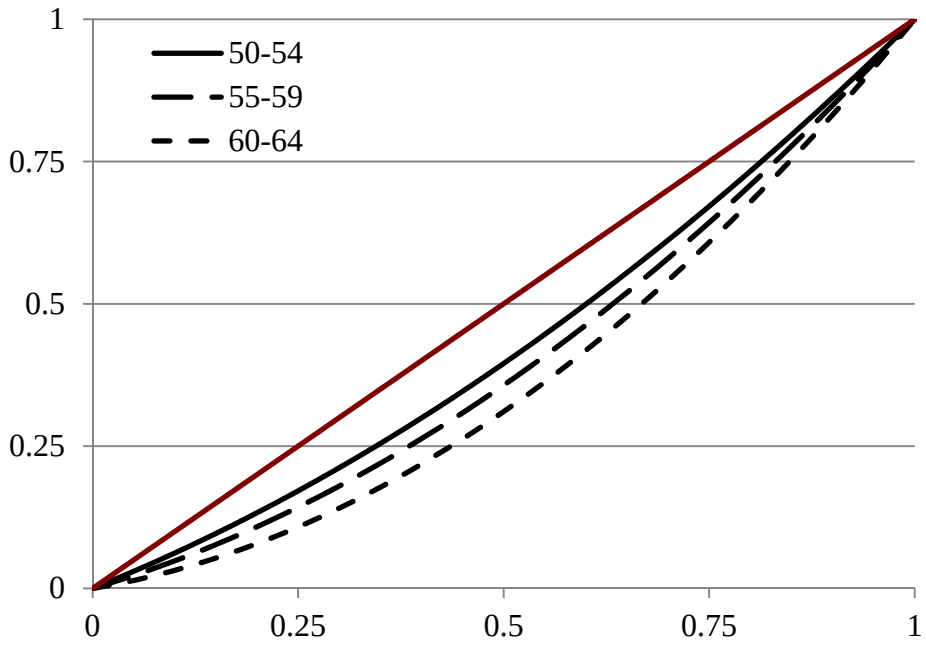
Source: Authors' calculations.

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



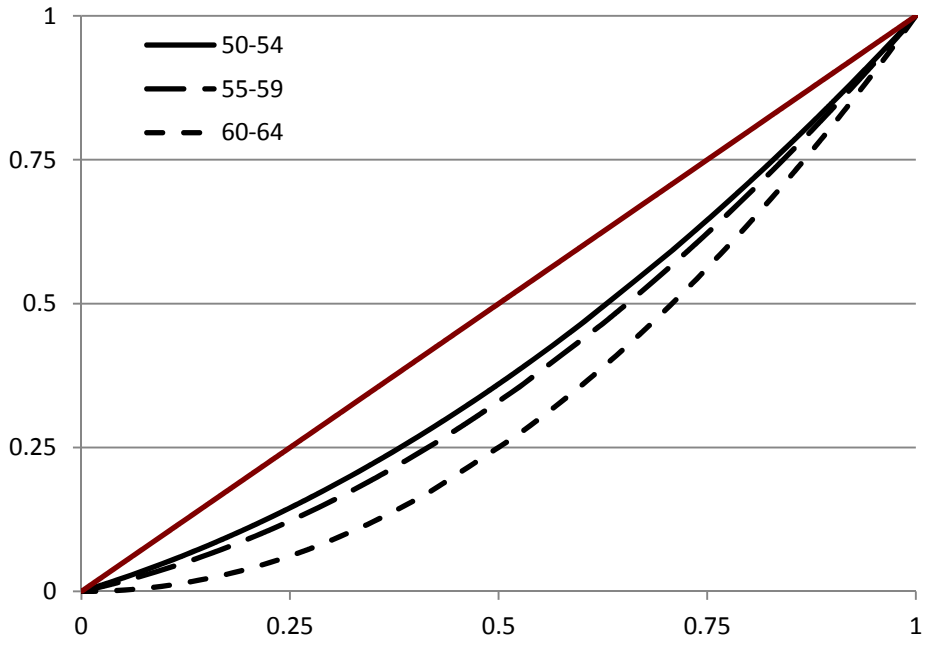
Source: Authors' calculations.

Figure 3. *Lorenz Curves by Age Cohorts*



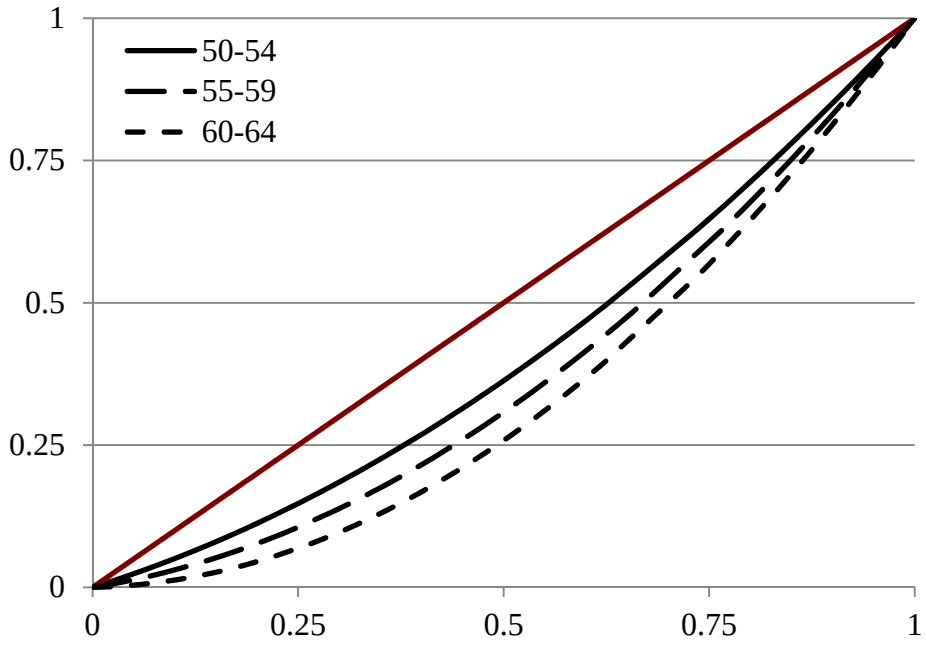
Source: Authors' calculations.

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



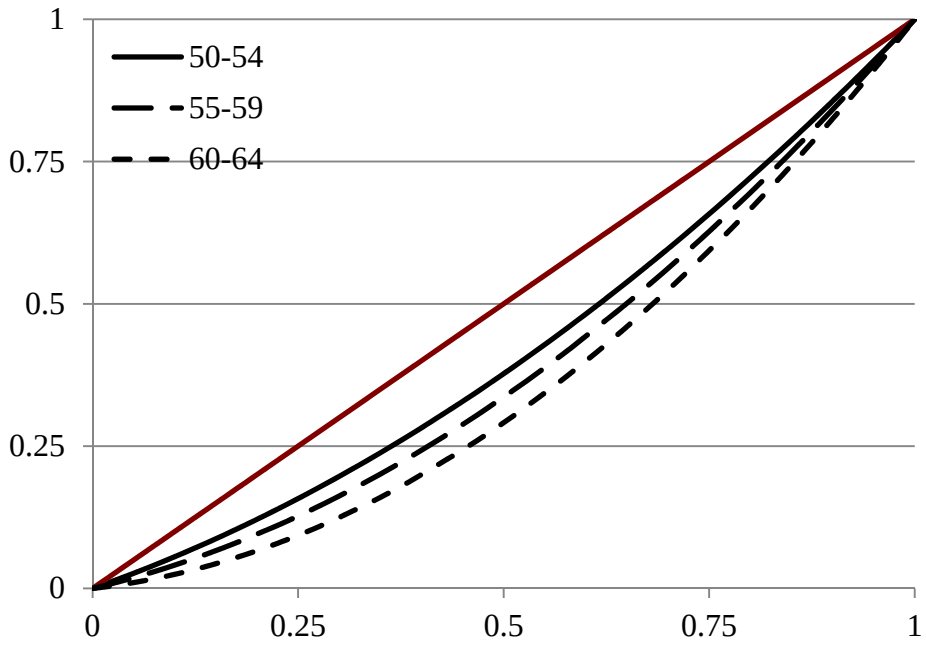
Source: Authors' calculations.

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



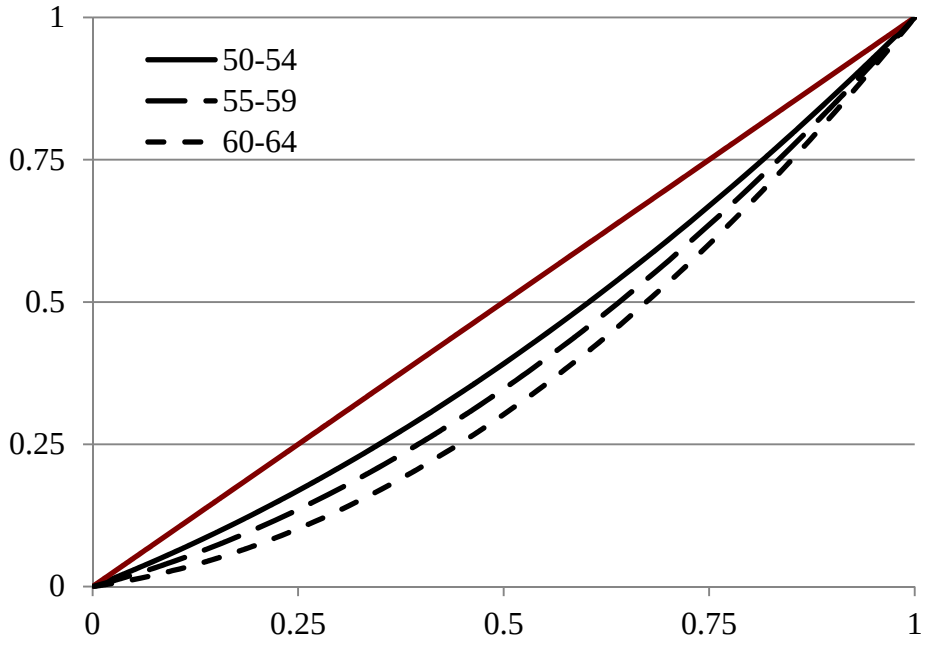
Source: Authors' calculations.

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



Source: Authors' calculations.

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

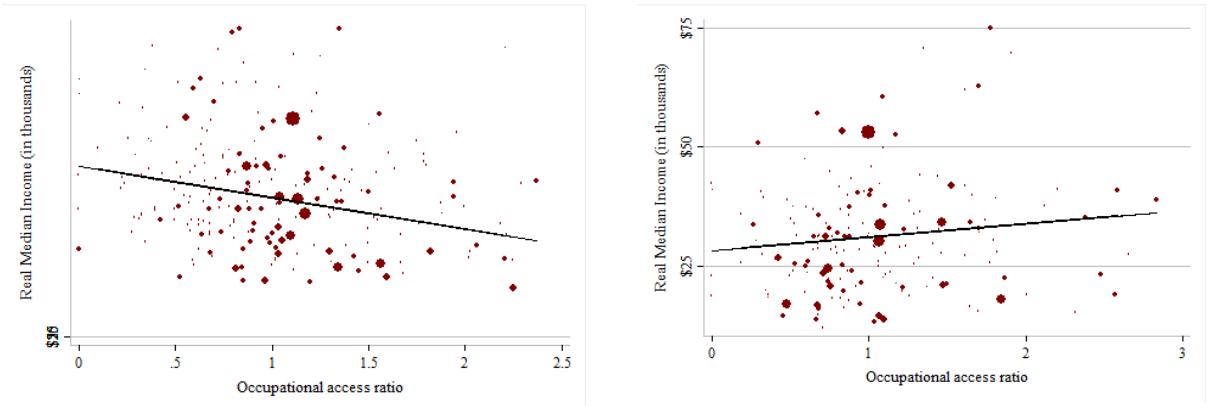


Source: Authors' calculations.

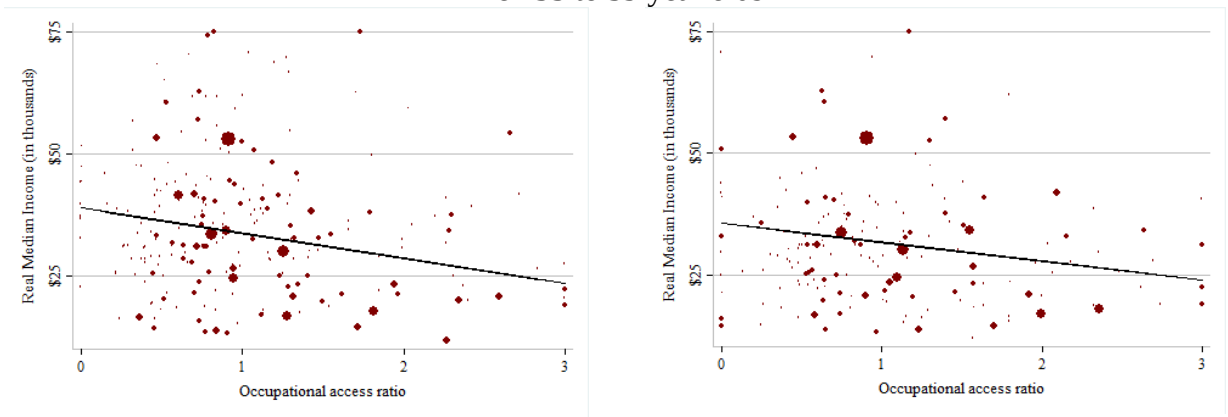
Figure 6. *Occupational Hiring Ratios and Median Earnings for Older Men, by Age and Education*

Some college education | No college education

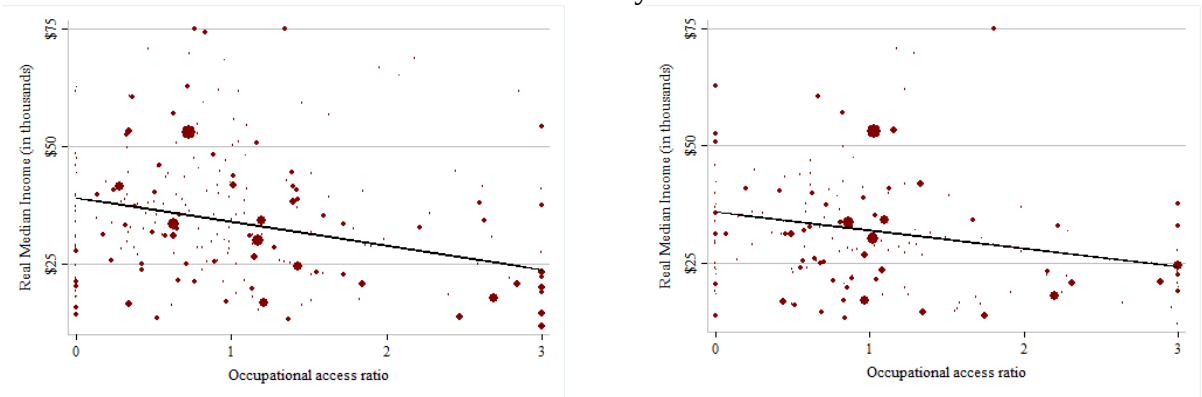
Men 50 to 54 year olds



Men 55 to 59 year olds

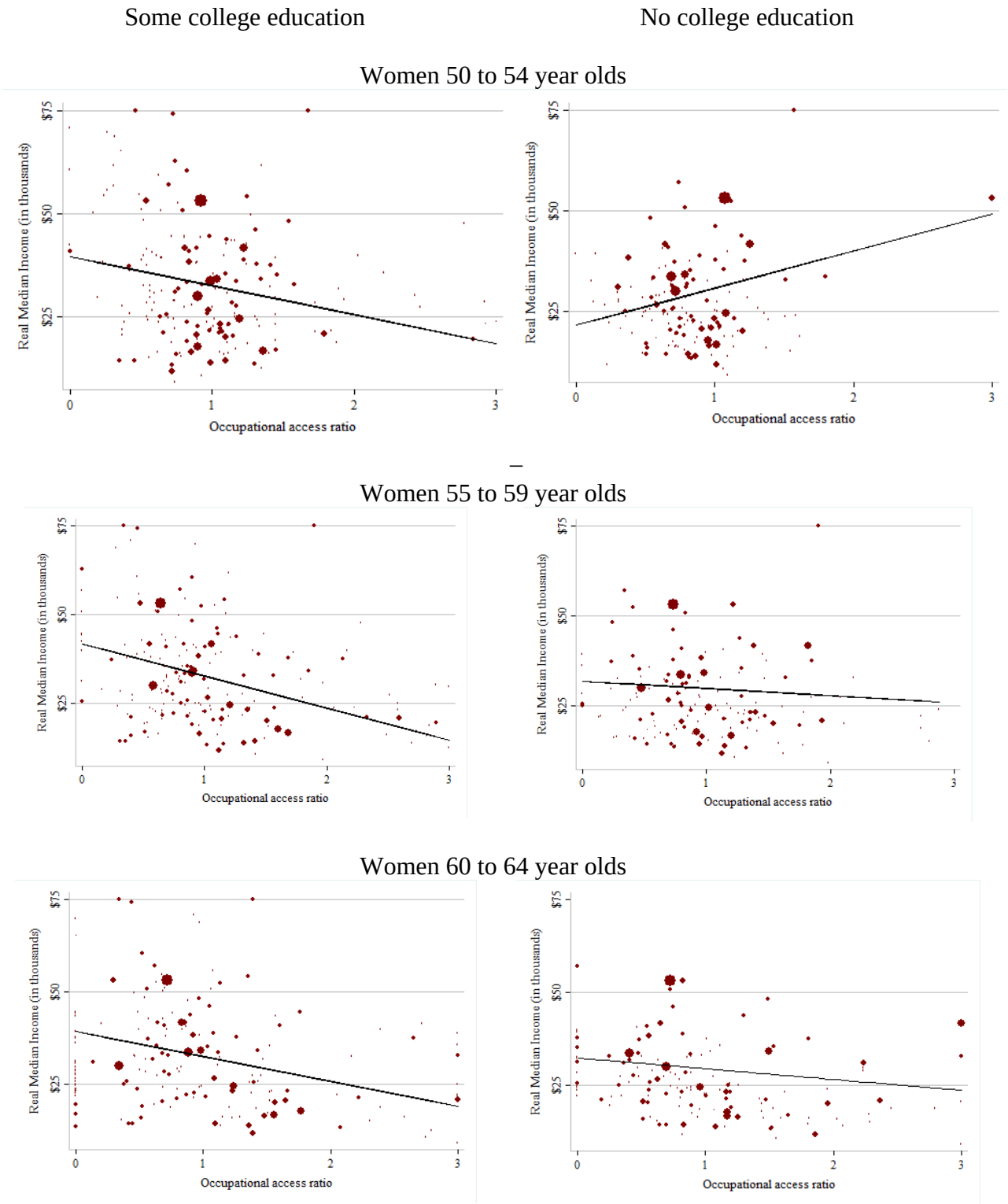


Men 60 to 64 year olds



Source: Authors' calculations.

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



Source: Authors' calculations.

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

	Number of occupations	Percent of older hires included
All	319	84.2%
Men with some college or more	233	61.5
Men with no college	174	45.9
Women with some college or more	193	50.9
Women with no college	147	38.8

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

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

Occupation	Older hires	Prime hires	OH ratio
Age 50-54			
Top 5			
Supervisors of guards	19	67	2.22
Grinding, abrading, buffing, and polishing workers	16	56	2.24
Mail and paper handlers	8	25	2.51
Tailors	9	28	2.52
Guides	8	24	2.61
Bottom 5			
Roofers and slaters	5	210	0.19
Postal clerks, excluding mail carriers	3	99	0.24
Fire fighting, prevention, and inspection	3	99	0.24
Geologists	3	97	0.24
Helpers, surveyors	3	77	0.31
Age 55-59			
Top 5			
Rollers, roll hands, and finishers of metal	6	24	3.12
Sales engineers	8	31	3.23
Farmers (owners and tenants)	51	193	3.30
Guides	7	24	3.65
Sales demonstrators / promoters / models	18	46	4.89
Bottom 5			
Repairers of data processing equipment	7	280	0.31
Dental assistants	6	235	0.32
Respiratory therapists	3	115	0.33
Physical therapists	7	249	0.35
Roofers and slaters	6	210	0.36
Age 60-64			
Top 5			
Taxi cab drivers and chauffeurs	56	291	5.04
Sales demonstrators / promoters / models	9	46	5.12
Farmers (owners and tenants)	39	193	5.29
Protective services, n.e.c	8	35	5.99
Guides	9	24	9.82
Bottom 5			
Welders and metal cutters	4	526	0.20
Supervisors of construction work	7	702	0.26
Human resources and labor relations managers	3	245	0.32
Advertising and related sales jobs	3	228	0.34
Automobile mechanics	11	788	0.37

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	0.150	0.149	0.151	319
Age 55-59	0.223	0.221	0.224	319
Age 60-64	0.313	0.311	0.315	319
Men, some college or more				
Age 50-54	0.206	0.205	0.207	233
Age 55-59	0.286	0.283	0.288	233
Age 60-64	0.412	0.408	0.416	233
Men, no college				
Age 50-54	0.213	0.210	0.217	174
Age 55-59	0.321	0.318	0.325	174
Age 60-64	0.422	0.417	0.428	174
Women, some college or more				
Age 50-54	0.173	0.172	0.175	193
Age 55-59	0.243	0.241	0.244	193
Age 60-64	0.317	0.314	0.319	193
Women, no college				
Age 50-54	0.148	0.147	0.149	147
Age 55-59	0.208	0.207	0.210	147
Age 60-64	0.289	0.287	0.291	147

Source: Authors' estimates from the *Current Population Survey*, 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	0.198	253	0.180	263	0.160	230
Age 55-59	0.263	253	0.261	263	0.238	230
Age 60-64	0.404	253	0.354	263	0.352	230
Men, some college or more						
Age 50-54	0.246	136	0.252	153	0.212	138
Age 55-59	0.317	136	0.342	153	0.287	138
Age 60-64	0.515	136	0.462	153	0.456	138
Men, no college						
Age 50-54	0.260	98	0.258	113	0.223	94
Age 55-59	0.333	98	0.379	113	0.357	94
Age 60-64	0.518	98	0.458	113	0.454	94
Women, some college or more						
Age 50-54	0.251	128	0.220	136	0.194	119
Age 55-59	0.355	128	0.273	136	0.257	119
Age 60-64	0.455	128	0.373	136	0.319	119
Women, no college						
Age 50-54	0.190	106	0.182	101	0.170	79
Age 55-59	0.259	106	0.225	101	0.245	79
Age 60-64	0.374	106	0.312	101	0.296	79

Source: Authors' estimates from the *Current Population Survey*, 1996-2012.

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

	Summary statistics		(1)		(2)	
	Mean	SE	Coef	SE	Coef	SE
Turnover rate	0.59	0.19	-0.275	(0.123)**	-0.259	(0.120)**
Share with 15+ years of tenure	0.32	0.11	-0.890	(0.292)***	-0.927	(0.294)***
Communication skills	0.17	0.12	1.754	(0.627)***	1.436	(0.623)**
Numerical ability	0.54	0.33	0.086	(0.219)	0.056	(0.218)
Active learning	0.04	0.02	-0.946	(2.268)	-0.827	(2.261)
Computer skills	0.04	0.04	-1.280	(1.181)	-0.978	(1.178)
Experience	0.12	0.04	1.150	(0.758)	1.124	(0.756)
Training	0.15	0.03	0.548	(1.182)	0.738	(1.186)
Education	0.13	0.06	-0.188	(0.596)	-0.153	(0.594)
Judgment	0.26	0.10	-1.490	(0.850)*	-1.294	(0.853)
Social skills	0.12	0.10	1.370	(0.994)	1.444	(0.993)
Strength	0.12	0.07	-0.748	(0.703)	-0.595	(0.699)
Dependability	0.56	0.30	-0.612	(0.496)	-0.572	(0.493)
10-year growth in employment	0.97	1.73	0.052	(0.017)***	0.036	(0.018)**
10-year growth top-coded (0/1)	0.11	0.31	-0.016	(0.089)	-0.019	(0.094)
Unemployment rate	5.75	0.12	-0.421	(0.125)***	-0.415	(0.123)***
Share involuntary part time	0.08	0.06	-1.143	(0.631)*	-1.381	(0.641)**
Share voluntary part time	0.11	0.14	0.645	(0.368)*	0.569	(0.367)
Working outdoors	0.09	0.06	1.808	(0.735)**	1.559	(0.732)**
Physical skills	0.17	0.09	3.479	(1.087)***	3.015	(1.091)***
Exposure to hazards	0.04	0.03	-4.019	(1.943)**	-3.634	(1.957)*
Union coverage	0.15	0.13	-0.194	(0.171)	-0.141	(0.173)
Share of firms with < 24 employees	0.16	0.13	0.640	(0.454)	0.577	(0.457)
Share of firms with 25-99 employees	0.13	0.07	-1.076	(0.392)***	-1.170	(0.395)
Log of real weekly earnings	6.33	0.43	-0.458	(0.100)***	-0.410	(0.100)***
Pension coverage	0.56	0.14	0.752	(0.220)***	0.643	(0.220)***
Occupational employment ratio	1.98	4.74			0.018	(0.006)***
Age 50-54 (0/1)	0.33	0.47	-0.040	(0.034)	-0.035	(0.034)
Age 60-64 (0/1)	0.33	0.47	0.102	(0.063)	0.097	(0.063)
Female (0/1)	0.49	0.50	-0.203	(0.047)***	-0.228	(0.047)***
Some college or more (0/1)	0.54	0.50	-0.078	(0.055)	-0.088	(0.055)
Constant			6.217	(1.345)	5.984	(1.330)
Sample size			2,172		2,172	
R^2			0.133		0.143	
Adjusted R^2			0.121		0.130	

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

Table 6. *Average of Occupations' Median Earnings, by Occupational Hiring Ratio*

	Ages 30-49	Ages 50-54	Ages 55-59	Ages 60-64
All workers				
Average occupation's earnings	$553	$543	$569	$553
Change from prime-age average		-2%	3%	0%
Hiring ratio of 1.33+				
Share of cohort		19.7%	31.4%	43.4%
Average occupation's earnings		$516	$472	$458
Change from prime-age average		-7%	-15%	-17%
Hiring ratio of 0.75-1.33				
Share of cohort		68.0%	50.9%	34.0%
Average occupation's earnings		$541	$608	$598
Change from prime-age average		-2%	10%	8%
Hiring ratio of 0-0.75				
Share of cohort		12.3%	17.7%	22.6%
Average occupation's earnings		$597	$625	$667
Change from prime-age average		8%	13%	21%

Note: Average occupation's weekly earnings are the average among all occupations' median earnings, adjusted for inflation (2010 dollars).
Source: Current Population Survey Occupational Mobility and Job Tenure Supplements, 1996-2012.

Table A1. *Summary Statistics of Key Variables*

	Mean	Std dev
Occupational hiring ratio	1.09	0.76
Ages 50-54	0.33	0.47
Ages 55-59	0.33	0.47
Ages 60-64	0.49	0.50
Female	0.54	0.50
Some college or more	6.33	0.43
Real weekly log earnings	0.56	0.14
Pension coverage	0.59	0.19
Share with 15+ years of tenure	0.32	0.11
Turnover rate	0.04	0.02
Active learning	0.17	0.12
Communication skills	0.26	0.10
Judgment	0.13	0.06
Education	0.12	0.04
Experience and training	0.15	0.03
Working outdoors	0.09	0.06
Social skills	0.12	0.10
Numerical ability	0.54	0.33
Strength	0.12	0.07
Physical skills	0.17	0.09
Computer skills	0.04	0.04
Dependability	0.56	0.30
Exposure to hazards	0.04	0.03
Unemployment rate	5.75	0.12
10-year growth in employment	0.97	1.73
Involuntary part time	0.11	0.31
Voluntary part time	0.08	0.06
Union coverage	0.11	0.14
Share of firms with < 24 employees	0.15	0.13
Share of firms with 25-99 employees	0.16	0.13
Occupational worker ratio	0.13	0.07
Sample size	2,172	

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

Table A2. *Summary Statistics of Occupational Hiring Ratios by Age, Gender, and Education*

Cohort	Mean	Median	Std dev
50-54	1.120	1.073	0.368
55-59	1.264	1.079	0.719
60-64	1.454	1.078	1.292
	Men		
Overall	1.290	1.063	0.893
College			
50-54	1.141	1.110	0.405
55-59	1.338	1.005	0.828
60-64	1.406	0.848	1.423
No college			
50-54	1.148	1.066	0.457
55-59	1.406	1.137	0.963
60-64	1.871	1.031	1.776
	Women		
Overall	1.150	1.108	0.482
College			
50-54	1.110	1.097	0.331
55-59	1.196	1.102	0.517
60-64	1.340	1.136	0.904
No college			
50-54	1.080	1.125	0.258
55-59	1.110	1.079	0.397
60-64	1.287	1.173	0.769

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