Appeared in *Industrial and Labor Relations Revie*w, Vol. 53, No. 3, April 2000, pp. 401-18.

Occupational Age Structure and Access for Older Workers

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Abstract

This paper examines covariates of the occupational age structure and the openness of jobs to older workers. Using a large number of data sets, which together span the years 1983-98, the authors focus on the structure of compensation, job skill requirements, and working hours and conditions as the principal determinants of occupational access. Older male and female workers, they find, face substantial entry barriers in occupations with steep wage profiles, pension benefits, and computer usage. In addition, union coverage is associated with limited access for older men, while older female hires are concentrated in occupations where flex-time, part-time work, and daytime shifts are common. Segregation across occupations among older new hires exceeds that for younger workers, but there is no evidence that it has worsened over time.

In the economics literature on aging and the labor market, scant attention has been given to the employment opportunities available to older workers or how these opportunities are related to the job content. This lack of attention is not surprising, given that older workers fare well by such standard measures as earnings, unemployment, and displacement risk. Anecdotal evidence and a limited amount of scholarly research, however, suggest that older workers have constrained employment options.

This paper examines the job opportunities faced by older workers. We first review previous literature and outline a framework by which the age structure of occupations is determined. In interpreting the evidence, job matches and the occupational age structure are viewed as the result of choices by workers and employers. For employers, we stress the roles played by fixed training costs and fringe benefits and the divergence between current productivity and compensation among older workers owing to implicit contracts and deferred compensation. For workers, we emphasize the return to skill acquisition and the mismatch of occupational characteristics that may arise with age, in addition to standard labor supply determinants such as health status, pension wealth, health insurance, and the opportunity cost of time. Finally, we consider how labor rents resulting from union coverage or employer size impact mobility among older workers.

The paper next describes the construction of our occupational database, created from compilations across several micro data sets. Included are measures of the occupational compensation structure, skill requirements, and working conditions. Descriptive evidence and statistical analysis are used to examine the covariates of the occupational age structure and the "openness" of jobs to older hires. Age segregation measures are then calculated in order to evaluate changes over time in opportunities facing older (and younger) workers.

Background and Previous Literature

By most measures, older workers fare well. Experienced workers realize a substantial wage advantage relative to young workers, an advantage that grew during the 1980s (e.g., Levy and Murnane 1992). Unemployment rates are lower for older than younger labor force participants. In 1998, when the annual rate of unemployment among all men was 4.4% and that among men ages 25-54 was 3.3%, rates for men 55-64 and 65+ were 2.8% and 3.1%, respectively. Corresponding rates among women were 4.6%, 3.8%, 2.4%, and 3.3% (U.S. Bureau of Labor Statistics 1999, Table 3). And although 19% of men and 39%

of women ages 55 and over are employed part-time, few of these workers -- 5% among both men and women -- report their part-time status as being for "economic reasons" (U.S. Bureau of Labor Statistics 1999, Table 8). Older workers' risk of job displacement is, if anything, lower than that for middle-age workers, and substantially lower than that for young workers (Farber 1997, Table 1, Appendix Tables 3a, 3b).

The positive picture presented above is misleading. Although older workers have relatively few unemployment spells, the duration of given spells increases with age (U.S. Bureau of Labor Statistics 1999, Table 31). Among those displaced, older workers have the lowest reemployment probabilities, the longest time to reemployment, high probabilities of part-time employment, and the largest wage losses (Farber 1997, Chan and Stevens 1999). And consistent with anecdotal evidence, there is some suggestion of an increase during the 1990s in *relative* rates of displacement among older, educated, white-collar workers (Farber 1997, Figures 3a, 3b, 4a, 4b, 5). Hutchens (1988, 1993) concluded that job opportunities are more constrained for older workers than for younger workers. And Johnson and Neumark (1997) provided evidence from the National Longitudinal Survey of Men (NLS) that perceived age discrimination is associated with subsequent declines in employment and earnings.[1]

In this paper we emphasize the role played by job and occupational characteristics on job mobility among older workers. Ruhm (1990), among others, measured the frequency of "bridge" jobs among older workers.[2] An implication of our analysis is that bridge jobs would occur more frequently were job opportunities facing older workers not so limited. Our study is most closely related to work by Hutchens (1986, 1988, 1993) and Scott, Berger, and Garen (1995), briefly summarized below.[3]

Hutchens attempted to measure whether job opportunities were restricted among older workers. Using Census data (Hutchens 1986) or CPS supplements with job tenure information (Hutchens 1988,

[1] Age discrimination cannot be directly measured either by standard wage equation analysis, since age is correlated with productivity and implicit contracts break down the equivalency of spot marginal products and wages, or by the number of lawsuits, since reporting is endogenous.

[2] Using the Retirement History Survey, Ruhm defines bridge or non-career jobs as jobs held by older workers that are not their longest-held jobs.

[3] Following completion of this paper, a related article by Heywood, Ho, and Wei (1999) appeared. The authors examine the hiring of older workers in Hong Kong, where there exist no age discrimination laws. Heywood, Ho, and Wei found, as we have, that older workers are less likely to be hired by employers in jobs with high training costs and in jobs with deferred compensation

1993), he measureed the ratio of the proportion of *new* hires who are older workers to the proportion of all workers who were old. Both this ratio and its two components are of interest. The denominator provides a measure of the age structure of an occupation (or industry-by-occupation), while the numerator provides information on the types of jobs into which older workers are hired. Since the latter measure reflects the preferences of both employers *and* employees, it can be a misleading indicator of employment opportunities. A low ratio, however, indicates that there are few new hires of older workers relative to the number of older workers employed in that occupation. This suggests that relative to the number of older workers able or willing to work in an occupation, few are hired.

Employment barriers facing older workers appear to result from high fringe benefit costs (Scott, Berger, and Garen 1995; Garen, Berger, and Scott 1996) and from implicit wage contracts whereby younger workers are underpaid and older workers overpaid relative to productivity (Hutchens 1986). In a related analysis, Hutchens (1988) developed a segregation index for older worker employment; he reported that employment was more segregated among older new hires than among older workers in general or among younger new hires.

Our analysis expands the work of Hutchens and others in two principal directions. First, we provide evidence that relates differences in employment opportunities to a wide array of variables measuring occupational compensation structure, skill requirements, and working conditions. Second, we provide evidence on changes over time in job segregation among older workers.[4]

Labor Market Transitions and the Age Structure of Jobs

In this section, we discuss the theoretical framework used to interpret our empirical evidence on age structure and job transitions. The sorting of individuals into jobs and the resulting age structure of occupations are determined through the interaction of heterogeneous workers and employers. Workers maximize the expected present value of utility, subject to constraints; firms maximize the expected present value of profits, which are increasing in revenues and decreasing in costs. Choices made by workers and

[4] Filer and Petri (1988) examine the relationship between occupational characteristics, as measured by the *Dictionary of Occupational Titles* (*DOT*), retirement behavior, and the presence of pension and health benefits. They concluded that a number of occupational characteristics are related to retirement behavior. In a paper using the 1992 Health and Retirement Study (HRS), however, Hurd and McGarry (1993) found little relationship between *prospective* labor market transitions and the physical or skill content characteristics measured in the HRS. They did find that hours and financial considerations are important determinants of expected behavior.

firms are affected and constrained by numerous factors: individual preferences, the value of time in alternative activities, the wage rate, private and government pension structures and entitlements, health, product demand, technology, productivity, the cost and valuation of workplace amenities, tax rules, and government regulation of the workplace. Employment decisions are made jointly with decisions about the structure of pensions, the wage profile, the organization of work and technology, and public policy. Hence, observed outcomes map out neither labor supply nor labor demand functions but, rather, an "envelope" curve representing satisfaction of marginal equilibrium conditions among heterogeneous workers and firms.

Because of the complexity by which the age structure is determined, we regard the subsequent statistical evidence as largely descriptive. But such evidence can be interpreted using a maximizing economic framework, as discussed in this section. We focus below on how job compensation, skill requirements, and working conditions affect the age structure of occupations.

Compensation Structure

Two elements of the compensation structure are examined -- "wage tilt" and fringe benefits (specifically, pensions and health insurance). By wage tilt we mean the rate of wage growth or steepness of the earnings-experience profile, following control for other measurable wage determinants. The slope of the wage profile in part reflects past human capital investment, only some of which is transferable across jobs. A steep wage profile may also reflect deferred compensation, with wages rising faster than productivity (for firm-level evidence, see Medoff and Abraham 1980). Because wage tilt is likely to provide a proxy for the excess of current relative to alternative compensation among older workers, it has implications for occupational access.

Wage tilt reflecting deferred wages would lead workers, *ex post*, to retire or leave a "career" job at an age beyond that which maximizes the joint worker-firm surplus, *ex ante*. The use of defined benefit pension plans that provide financial incentives to workers who retire within a particular age range can offset this tendency and encourage earlier retirement (for evidence, see Ippolito 1991). Wage growth that exceeds productivity growth has an indeterminate effect on the age structure of the workforce, but should be unambiguously associated with a low probability of *hiring* older workers. The substitution effect associated with wage tilt delays job change by raising the return to the current job relative to an alternative job or

retirement. Wage tilt, therefore, may be accompanied by pension plans that discourage continued work. Moreover, wage tilt and defined benefit pension plans will occur in those jobs where an early exit age is planned (Filer and Petri 1988). Wage tilt will unambiguously reduce the hiring of older new workers if firms pay older workers with low as well as high seniority wages in excess of marginal products.

The compensation mix also should affect the age distribution of workers. On the supply side, the structure of defined benefit plans encourages participation among "young" senior workers and discourages participation among older workers beyond a "normal" age or years' service at which the present value of benefits is maximized (Ippolito 1987; Gustman, Mitchell, and Steinmeier 1994; Ruhm 1996). On the demand side, providing defined benefit pension eligibility to an older new hire will have a high cost to the firm and few of the benefits that attach to their use in a long-run employment relationship.

Health insurance has ambiguous effects. On the one hand, older workers are less likely to exit from jobs with health coverage, at least prior to Medicare eligibility. On the other hand, higher health costs associated with older workers will discourage firms from employing and hiring older workers (Scott, Berger, and Garen 1995), unless health costs can be shifted backward to older workers via lower wages. If costs can be shifted, then health coverage is likely to be high in jobs employing and hiring older workers owing to the tax and risk-pooling advantages from purchasing insurance through an employer.

Occupational Skill Requirements, Hours, and Working Conditions

Our next area of focus is the effect of job skill requirements. Returns to training tend to decline with age owing to high opportunity costs and a shorter period over which to realize benefits. Older workers who change jobs are likely to either remain in the same occupation, thus permitting the transfer of occupation-specific skills, or switch to an occupation in which required skills can be acquired at low cost. Employers are not likely to hire older workers in jobs requiring substantial firm investment in worker training.[5]

Job working conditions and hours should have an impact on the age structure of occupations. Many working conditions cannot be varied absent a change in job or occupation. Over time a mismatch may develop between workers and jobs with respect to hours worked, physical demands, and other job attributes

[5] Acemoglu and Pischke (1998) show how low levels of worker turnover, independent of skill specificity, lead employers to invest in general as well as firm-specific training.

(for an excellent discussion, see Hurd and McGarry 1993). If a mismatch develops with the current job *and* viable alternative jobs, then we should observe a more rapid rate of exit from the labor force. If job attributes differ significantly across jobs, and older workers can readily transfer their skills, then we should observe job transitions of older workers correlated with changes in job characteristics. In such cases, we expect older job switchers to move into occupations with lower work hours, less demanding working conditions, and relatively low training costs. For many older workers, however, new jobs providing a preferred bundle of working conditions cannot be obtained without suffering a substantial wage loss. Here, job switching rates should be low among older workers.

Job Transitions and Rents

There may exist worker rents associated with industry wage differentials (Krueger and Summers 1987), unionization, employer size (Brown and Medoff 1989), regulated industries, or other factors. Receipt of a wage premium lowers quits and increases applicant queues. But it is not obvious how rents should affect the age distribution of incumbent workers or new hires. On the supply side, worker rents increase the payoff from working relative to retirement, but may also be associated with greater career savings and pension benefits. On the demand side, a high wage expands the applicant pool and is likely to decrease hiring of younger, less experienced workers. But absent knowledge about how the wage distribution with respect to age is affected, we can predict little.

We do know that unionization is associated not only with rents, but also with a flatter wage profile and greater frequency of pension and health insurance coverage. By controlling for union density, we insure that we do not incorrectly attribute to wage tilt or fringe benefits (or other variables correlated with union density) effects on the age distribution that are a direct effect of collective bargaining. A similar argument can be made for the inclusion of firm size, which is correlated with the wage level, fringes, and union density.

The framework outlined above is next used to interpret the relationship between the age distribution of incumbent workers and new hires and occupational job characteristics.

Measures of the Age Structure and Occupational Access

Much of our analysis uses Census-delineated detailed occupations as the unit of analysis. "Occupation" is appropriate in that it approximates the concept of "job type" in terms of skill requirements and working conditions. We develop complementary measures of the age structure of occupations. The static age distribution can be readily measured. For descriptive purposes, we utilize worker age at the 90th (*P90*), 50th (*P50*), and 10th (*P10*) percentiles to identify "old" and "young" occupations. Although median age is a standard measure, it provides limited information about the age *distribution* of workers. A measure highly correlated with *P90*, which we use in subsequent regression analysis, is *Age50+*, representing the proportion of workers in an occupation who are 50 or over. An additional static measure of occupational age structure is the coefficient of variation, *CV(Age)*, measuring the age dispersion of an occupation.

In order to measure market opportunities and the dynamics of the market for older workers, we calculate measures similar to those developed by Hutchens (1986, 1993). The measure *Hire50+* represents the proportion of workers by occupation who are "new" hires in a company, defined here as workers with 5 or fewer years of company tenure who are ages 50 and over. *Hire50+* provides a measure of the age structure among recent hires. A low value of *Hire50+* may indicate either that firms are restricting the hiring of older workers in an occupation or that few older individuals are able or willing to work in that occupation. Hutchens has proposed a measure combining information on new hires and the existing age structure in order to approximate whether hiring opportunities or access, relative to preferences and abilities, are restricted for older workers. Letting *Open50+* be equal to *Hire50+*/*Age50+*, it represents an index measuring the openness or accessibility of an occupation to older new hires, relative to the number of existing older workers.

Open50+ and its component parts provide useful information. For example, occupations requiring strength may have low levels of existing older workers (*Age50+*) and older new hires (*Hire50+*), but need not have low accessibility relative to worker preferences and abilities (*Open50+*). Occupations that defer compensation via wage tilt, pensions, and health benefits may employ many senior workers yet hire few older workers (a high *Age50+*, but low *Hire50+* and *Open50+*). The negative relationship between wage tilt and accessibility for older workers is precisely the relationship considered by Hutchens (1986).

Following descriptive evidence on the occupational age structure measures described above, we examine their determinants, estimating gender-specific models of the following general form.

(1) $$Age50+ = Compmix\alpha_a + Skills\beta_a + Conditions\tau_a + X\Gamma_a + \varepsilon_a$$

(2) $$Hire50+ = Compmix\alpha_b + Skills\beta_b + Conditions\tau_b + X\Gamma_b + \varepsilon_b$$

(3) $$Access = Compmix\alpha_c + Skills\beta_c + Conditions\tau_c + X\Gamma_c + \varepsilon_c$$

(4) $$CV(Age) = Compmix\alpha_d + Skills\beta_d + Conditions\tau_d + X\Gamma_d + \varepsilon_d$$

Estimation is by weighted least squares (WLS), with gender-specific occupational employment as weights.[6] All variables are measured at the occupation level (we omit a subscript indexing occupation). *Compmix* represents a vector including the wage level, wage tilt, health insurance, and pension coverage; *Skills* a vector including education, company-provided training, computer usage, and required numerical aptitude; *Conditions* includes measures of the frequency of shift work, long hours (more than 42 hours worked per week), part-time employment, flex-time, outdoor work, occupational strength requirements, exposure to extreme environmental conditions, job hazards, and physical demands; and *X* includes variables measuring the proportion of workers unionized, employed in large firms, and the rate of employment growth.

As indicated in the previous section, the coefficients α, β, τ, and Γ should vary in a predictable way across equations. For example, we expect skill variables to be associated with the presence of incumbent older workers but few young workers and few older new hires. Wage tilt and pension benefits may be associated with low age dispersion and limited access to older workers. Occupations with low training and skill requirements will attract young workers, but they may also attract older workers who have left their career jobs, assuming physical demands and hours requirements are not onerous.

Data and Descriptive Evidence on Occupational Age Structure and Access

Our study relies on data assembled from a large number of data sets. Much of the occupational analysis is based on gender-specific variables compiled by us from various micro-level Current Population Survey (CPS) files. The data sets used in the paper include the CPS Outgoing Rotation Group Monthly Earnings Files (CPS-ORG) for the years 1983-95; the March CPS Annual Demographic Files for 1983-95;

[6] WLS estimation using employment weights provides coefficient estimates representative of the occupation of an average worker rather than the average occupation, while also weighing less heavily observations whose variables are calculated with greater error.

CPS training supplements for January 1983 and 1991; CPS computer use supplements for October 1984 and 1989; CPS dual job/shift work supplements for May 1985 and 1991; and CPS tenure supplements for January 1983, May 1983, January 1987, May 1988, January 1991, April 1993, February 1996, and February 1998. Occupational skill and working condition variables are obtained from the fourth edition *Dictionary of Occupational Titles (DOT)*, as mapped to 1980 Census occupation codes by England and Kilbourne (1988) and made time-consistent by us to account for the minor changes between the 1980 and 1990 Census codes. *DOT* variables are not gender-specific. Definitions of and sources for all variables used in our analysis are provided in the appendix.

We turn first to descriptive evidence on the age structure of occupations. Table 1, with panels for men and women, respectively, include *selected* occupations based on size, number of old or young workers (*P90* or *P10*), proportion of older new hires (*Hire50+*), accessibility to older workers (*Open50+*), and age dispersion (*CV(Age)*). Among men, occupations with the oldest workers (a high *P90*) tend to be those requiring few physical demands, flexible hours and schedules, and, for the most part, low skill and training requirements (e.g., crossing guards, messengers, private guards, and taxi and bus drivers). Chief executives and judges are exceptions to the generalization regarding skills, presumably because skills in these occupations depreciate slowly. Most of the occupations with high *P90*s also hire a high proportion of older workers, as compared to the economy-wide mean for *Hire50+* which is .10. Interestingly, many "old" occupations (e.g., messengers, parking lot attendants, and private guards) have high age dispersion and many young workers, *P10* being below the economy-wide mean of 23.

Occupations with low training requirements *and* high physical demands or undesirable hours tend to employ young but not older workers (e.g., stock handlers and baggers, cooks). Well-paid jobs requiring lengthy training tend to have few young *and* few old workers, the latter result owing to retirement combined with little new hiring of older workers. For example, skilled administrative and managerial occupations have low age dispersion. The accessibility measure *Open50+* (the ratio of the proportions of older new hires to older workers) is largely unrelated to age (the correlation of *Open50+* and *P90* is .03), and obtains some of its highest values in occupations with few older workers (e.g., recreation workers and food counter

workers). Occupations requiring substantial training tend to have low accessibility for older workers (the correlation of *Open50+* and firm training is -.26).

We obtain similar patterns among women (panel B of Table 1). Occupations with the oldest workers, on average, among women include household workers, welfare service aides, religious workers, and crossing guards. In many occupations, large numbers of young *and* old women are hired; for example, sales occupations, cashiers, and private household child care. Occupations in which older women appear to have limited access (low values of *Hire50+* and *Open50+*) tend to have high training requirements, demanding working conditions or, in a few cases, high-valued physical attributes (e.g., announcers and dancers). Occupations with skilled workers, a demanding work environment, and high rates of pension coverage tend to have relatively low age dispersion (e.g., registered nurses and teachers).

Occupational Age Structure and Access: Regression Results

Equations (1) through (4) provide a framework for examining the covariates of occupational age structure and access -- *Age50+*, *Hire50+*, *Open50+*, and *CV(Age)*. Table 2 presents the WLS regression results for these equations for men and women. We organize our discussion around the four groups of explanatory variables -- compensation level and structure, occupational skills, job working conditions and hours, and a category including union density, firm size, and demand growth.[7]

Compensation Level and Structure

Perhaps our most striking result is the statistically significant effect of wage tilt on the age structure. Occupations with steeper profiles, $\partial \ln W / \partial \ln EXP$, are less likely to have a high proportion of older workers (*Age50+*) and less likely to hire older workers (*Hire50+*). The point estimates imply that a .10 increase in the slope of the earnings profile (the mean is .13) is associated with a .035 decrease in the proportion of older workers and a large .047 decline in the proportion of older new hires (mean *Hire50+* is .101). Wage tilt also is associated with occupations that are less open or accessible to older new hires, measured by the ratio of older new hires to older incumbents (*Open50+*). This finding provides support for implicit contract theories predicting relative underpayment of young and overpayment of older workers relative to

[7] In order to gauge the relative importance of the many variables, we also estimated all equations using standardized beta coefficients. The relative size of the standardized coefficients followed closely the relative size of coefficient t-ratios, with the one exception that the relative impact of the pension variable was larger than suggested by its significance level.

productivity (see, relatedly, Hutchens 1986). It also helps explain both the barriers older workers face in obtaining employment and the substantial earnings losses among older displaced workers (e.g., Farber 1997, Tables 11, 12).

As predicted, higher wage occupations are found to be associated with older workforces, but with substantially less age dispersion. To some extent, the wage variable may reflect training or other skill-related job attributes not fully measured by other variables. Exclusion of the wage variable has a relatively modest effect on coefficients of other variables, with the exception of mean schooling with which it is highly correlated.

Pension coverage is positively related to the proportion of workers over 50 and participation of middle-age workers (see Ruhm 1996), but negatively related to *Open50+* and to age dispersion. That is, the presence of pension benefits acts as a barrier to job change. The evidence for this pattern is fairly strong for older men, but weak for older women.[8] No statistically significant relationship is found between health insurance coverage and the age structure variables for men or women. The absence of a negative relationship with *Hire50+* and *Open50+* is at odds with expectations and the conclusion reached in Scott, Berger, and Garen (1995), who tested this relationship more directly.

Occupational Skill Requirements

Skill variables are systematically related to the age structure, but the *type* of skill matters. As seen above, the occupational wage (skill) level is positively associated with age and negatively with age dispersion. Occupations with firm-provided training, those requiring high numerical aptitude, and those with high computer use have fewer older male workers. Although higher skill requirements are generally associated with lower age dispersion, computer use and numerical aptitude (among men) are exceptions, being associated with greater dispersion due to a large concentration of young workers. Occupations requiring computer use not only employ few older workers, but also are less accessible to older workers, at statistically significant levels, than are occupations (i.e., lower *Open50+*, as well as *Age50+* and *Hire50+*). Occupations requiring high numerical aptitude exhibit the same pattern, but only among men, not women.

[8] Garen, Berger, and Scott (1996) provided evidence that defined benefit pension plans discourage employers from hiring older workers for entry-level positions.

A broad generalization that emerges is that the older workforce is relatively high-skilled, but not strong in quantitative skills. Older workers are unlikely to select or be selected for jobs providing substantial on-the-job training or requiring computer-based skills.

Work Hours and Occupational Working Conditions

We consider four "work hour" features of occupations: the frequencies of shift work, overtime, part-time, and flex-time. The overall picture that emerges shows these features to be very important for women, but far less so for men.

Jobs with substantial amounts of evening and night shift work are less likely to employ or hire older women. Shift work is not strongly related to the male occupational age structure. Occupations with a high proportion of employees working long hours (more than 42 hours a week) have male and female workforces that are older but less age-dispersed. Occupations with high proportions of part-time male and female workers tend to have a more dispersed age distribution, and higher proportions of older workers and older hires. The former effect is strongest among men, since most part-time men are young, and the latter effect is stronger among women, reflecting large numbers of older part-time women. *Open50+* is unrelated to part-time work, suggesting that the relationship between part-time work and the age structure is primarily a labor supply rather than demand phenomenon.

Whereas the presence of "flex-time" programs in the workplace is not an important covariate for men, among women it is associated with a substantially older workforce and a higher proportion of older hires, but *lower* age dispersion, reflecting the fact that there are few younger women in jobs with flex-time. Either companies hiring and retaining older workers choose to adopt flex-time policies or companies adopting such policies attract and retain older workers.

We also examine occupational working conditions from the *DOT*. With few exceptions, working conditions are *not* strongly related to the age structure or job access for men or women. Occupations with exposure to *extreme* environmental conditions (noise, chemicals, etc.) have fewer older male workers and are less likely to hire older men. No such relationship is found for women, but few women are in such jobs. Required strength is not related, at conventional levels of statistical significance, to the age structure for women or men. Surprisingly, hazardous occupations are positively associated with *Hire50+* and *Open50+*

for men, while number of physical demands (climbing, reaching, stooping, etc.) is not related to the age structure for men or women. Occupations requiring work outdoors have a high dispersion in male worker age and display a somewhat higher older male hire rate than do other occupations. There is a statistically significant inverse relationship between outdoor work and employment of older women.

Taken as a whole, the weak relationship of these *DOT* variables with the occupational age structure and access supports the findings of Hurd and McGarry (1993), who, using microdata from the Health and Retirement Survey, found little effect of working conditions on prospective retirement. Our results remain a bit surprising, however, given the predictions from theory and our assessment of the descriptive data (Table 1). This discrepancy may arise in part from our use of a broad rather than narrow group of older workers (i.e., ages 50+ versus, say, 65+) in the regression analysis and collinearity of the *DOT* variables with the skill and other included variables. Or the limited mobility of older workers because of job skill requirements, wage tilt, and pensions may make it difficult to switch jobs in response to a mismatch in working conditions. At any rate, absent more compelling evidence, it is difficult to argue that there exists a substantial mismatch between occupational working conditions and the preferences of older workers remaining in the labor force.

Rents, Unions, and Wage Growth

Older workers' age structure and job opportunities may also be affected by the presence of worker rents or labor market institutions, captured empirically by union coverage. The principal effect of unionization should be to lower age dispersion within a work force. Rents associated with union compensation lower turnover and increase the number of prime-age workers. Pension benefits and more demanding working conditions (Duncan and Stafford 1980) lead to few very old workers. And selection by union employers from a lengthy applicant queue should lead to few very young workers.

As expected, union density is associated with lower age dispersion among men and women. Among men (but not women), the proportion of older workers and older new hires is also lower in highly unionized occupations. For both men and women, job access for older workers is lower in highly unionized jobs, perhaps indicating employer reluctance to hire older workers in jobs with generous health and pension benefits.

The proportion of workers in large firms (1,000+ employees) is generally unrelated to the age distribution for men, following other controls (see, also, Scott, Berger, and Garen 1995). Among women, however, there are fewer older female employees and fewer older hires. But age dispersion is higher in large firms, the latter outcome reflecting a very large population of young female employees in large firms.

Finally, the employment growth rate over the 1983-1995 period is associated with fewer male workers ages 50 and over, reflecting a concentration of young workers among new hires. Apart from this relationship, employment growth shows little relationship with the hiring of older workers or job access.

Overall, our regression results support and help clarify the general framework outlined in the previous section. There are predictable relationships between the occupational age structure and older worker hiring with respect to the skill and training requirements of jobs, the compensation level and mix, unionization, and work hour arrangements. In particular, older workers have highly restricted access to jobs with steep wage profiles and those offering pensions, occupations requiring computing skills, and jobs that are unionized. By contrast, job working conditions, apart from hours, exert little net influence on occupational age structure or occupations' openness to older new hires.

Age Segregation and Occupational Access: Have There Been Changes Over Time?

Hutchens (1988, 1991) has proposed the use of "segregation curves" to evaluate whether job access for older workers is constrained. He provided evidence (Hutchens 1988), based on the January 1983 CPS tenure supplement, that jobs among *newly hired* older workers are more highly concentrated across occupation-by-industry cells than the distribution of jobs among younger new hires or among older workers in general. He concluded that job opportunities are more segregated for old than for young new hires, and that there is greater segregation among newly-hired older workers than among older workers in general. Although evidence of greater segregation does not prove that occupational access is limited among older workers, it is surely supportive of that view.

We extend Hutchens's analysis by examining age segregation for five time periods: 1983, 1987, and 1991 using January CPS tenure supplements, and 1996 and 1998 using February CPS supplements. Two issues are investigated. First, we ask whether Hutchens's conclusions hold up when we use alternative data sets. Second, we examine whether age segregation has changed over time.

Hutchens's segregation curve is best illustrated with a diagram, shown by Figure 1. We first group all employed wage and salary workers into occupational cells -- 346 for men and 269 for women. We differentiate among alternative groups of workers; for example, newly-hired older workers (defined as workers age 50 and over with 5 or fewer years of tenure) are referenced as "type 1" workers while all other workers are referenced as "type 2" workers. Letting x_1 and x_2 be the numbers of type 1 and 2 workers, the ratio x_1/x_2, measuring the mix of older new hires to all other workers, is calculated for each occupation. Each occupation is then sorted from low to high values of x_1/x_2. In Figure 1, the vertical axis measures the *cumulative* percentage of type 1 (older new hire) workers, with occupations ordered by x_1/x_2. The horizontal axis measures the cumulative percentage of type 2 (all other) workers, again with occupations ordered by x_1/x_2. A plot of points is formed from the set of $P(c_2,c_1)_j$, where j represents occupations ordered by x_1/x_2, c_2 is the cumulative percent of type 2 workers, and c_1 is the cumulative percent of type 1 workers. If older new hires were distributed across occupations in exactly the same way as other workers, $P(c_2,c_1)_j$ would plot a 45 degree line of equality; if there were complete segregation, all points would lie along the horizontal and right vertical axes.

The segregation curve, much like Lorenz curves used to examine income inequality, lies below the line of equality, as seen by curve *OA* in Figure 1. As shown by Hutchens (1988, 1991), given reasonable assumptions one can unambiguously argue that one distribution is less equal than another if it lies everywhere below the other. Hutchens (1988) showed that job segregation among older new hires is unambiguously greater than among either younger new hires or all older workers. Although Hutchens (1988) did not do so, one can calculate a Gini coefficient (G) measuring the ratio of the area between the segregation curve and 45 degree line to the area under the 45 degree line (i.e., G=(5,000-B)/5,000, where the area under the 45 degree line is 5,000 and B is the area under the segregation curve). A G=0 would imply perfect equality (the 45 degree line) while a G=1 would imply complete segregation. Among segregation curves that do not intersect, G values provide the same rank ordering as do segregation curves (Hutchens 1991). The G coefficient is not without problems, however, since a higher G for one group than another does not rule out the possibility that their curves intersect. Despite this reservation, G provides a useful

metric for measuring the degree of segregation, although we are reluctant to place much emphasis on small differences in *G*.

Table 3 provides values of *G* for three groups of male and female workers -- older new hires (workers age 50 or over with 5 years or fewer company tenure), young new hires (new hires younger than 50), and all older workers. Values are calculated at five points over the 1983-98 period.

Our analysis makes two contributions to this line of research. First, we confirm Hutchens's previous findings, which he based on the January 1983 CPS. Occupational segregation is substantially greater for older new hires than for either young new hires or all older workers. Young new hires appear to have a slightly more equal distribution than all older workers. For the 1998 sample, values of *G* for males are .37, 25, and .31 for older new hires, young new hires, and all older workers, respectively. Corresponding numbers among female workers are .32, .21, and .25. Second, the results in Table 3 indicate there was no increase between 1983 and 1998 in occupational segregation facing older workers. *G* for male older new hires changes from .40 to .37, the change among older women is from .35 to .32. Although the recent decrease in *G* is suggestive of improving job prospects facing older workers, we are unwilling to attach weight to small changes in the concentration measure.[9]

Conclusions

Our largely descriptive analysis enhances knowledge about the occupational age composition and employment opportunities for older workers. Occupations in which older workers are employed need not be the same as those in which older workers are hired. We have found that the age structure of occupations and frequency of older new hires vary with respect to the compensation level and mix, skill requirements, working conditions and hours, and union status of the job.

The results are broadly consistent with the economic worker-firm matching framework we outlined. Among the more important findings are that steep wage-experience profiles are associated with fewer older male and female workers, fewer older hires, and a lower ratio of older hires to incumbent older workers. Pension benefits are more prevalent in jobs with older workers, but such jobs limit access to older hires.

[9] The concentration measures display sensitivity to sample size. Each of the supplements includes tenure responses for all eight CPS rotation groups in a single survey, so sample sizes are similar across years. Data for 1983 and 1991 correspond to recessionary periods, whereas data for the other years do not.

Occupations with extensive computer use have few older workers, few older hires, and limited openness. Work hours have an impact, particularly for women. Jobs requiring night and evening shifts have few older women and older hires, while jobs with flex-time schedules and in which part-time work is prevalent have many older female workers and older hires. For male workers, union status is associated with few older workers and hires, and more limited access. Least consistent with theory and expectations is evidence that most occupational working conditions (e.g., hazards, strength, physical demands) have little effect on age composition and access. The notable exception is that extreme environmental job risks limit hiring of and access to older men.

Our analysis makes clear that the generally positive outcomes observed among incumbent older workers provide an incomplete picture of the labor market. Positive outcomes for incumbents are not representative of the job opportunities facing older workers who switch jobs, or opportunities that would face non-switching older workers were they to change jobs. Although age segregation among older new hires exceeds that among older workers in general and that among younger new hires, we find no evidence that age segregation has worsened over time.

The long-run trend toward earlier retirement may reverse itself in the future as a result of slower growth than anticipated in pension wealth and reductions in the work disincentives associated with Social Security and defined benefit pension plans. The current structure of the labor market does not appear well-suited for later retirement, however, given the restricted employment opportunities facing older workers, particularly in jobs with high levels of deferred compensation or requiring use of computers. But labor markets and jobs change. For example, we may see flatter wage profiles evolve in response to such things as the increase in the number of older workers, the legal restrictions on mandatory retirement, the increase in Social Security retirement age, and the declining importance of defined benefit pension plans. If firms structure compensation to correspond more closely with current productivity, older workers' mobility should increase. Later retirement is also likely to lead employers and employees to search for alternative work arrangements and increased flexibility that increase the joint value of the work relationship. Such labor market developments have the potential to alleviate some of the difficulties faced by older workers. But

there is likely to remain a sizable number of older workers facing constrained opportunities both within and following their long-term career jobs.

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Table 1. Descriptive Statistics on Male Age Structure and Female Age Structure for Selected Occupations, 1983-95.

Occupation	*N*	*P90*	*P50*	*P10*	*Age 50+*	*Hire 50+*	*Open 50+*	*CV (Age)*
			A. Men					
All Men	1,192,721	55	35	23	0.191	0.101	0.529	33
Selected Large Male Occupations:								
Managers and administrators, n.e.c.	73,226	57	40	26	0.242	0.128	0.526	28
Truck drivers	50,326	56	36	23	0.204	0.134	0.655	33
Supervisors and proprietors, sales	34,574	54	36	24	0.162	0.092	0.565	30
Janitors and cleaners	31,645	62	38	19	0.313	0.219	0.700	40
Supervisors, production occupations	23,783	56	40	27	0.248	0.088	0.356	26
Sales representatives, mining, manufacturing	23,072	57	38	25	0.219	0.124	0.569	30
Laborers, except construction	20,758	54	31	19	0.150	0.092	0.615	38
Cooks	19,874	43	23	17	0.062	0.029	0.467	42
Construction laborers	15,030	53	30	19	0.139	0.080	0.574	38
Selected Old P90 Male Occupations:								
Crossing Guards	231	77	68	50	0.900	0.672	0.747	21
Chief executives and general administrators	272	69	49	34	0.493	0.341	0.692	26
Messengers	2,162	66	32	19	0.285	0.239	0.838	48
Clergy	6,384	65	45	30	0.404	0.224	0.555	28
Taxicab drivers and chauffeurs	2,883	65	40	24	0.323	0.277	0.857	36
Bus drivers	5,180	64	45	27	0.398	0.282	0.707	30
Selected High Hire50+ Male Occupations:								
Crossing guards	231	77	68	50	0.900	0.672	0.747	21
Tailors	450	63	46	25	0.418	0.445	1.066	32
Judges	638	68	53	37	0.592	0.439	0.741	23
Guards and police, excluding public service	12,136	64	40	22	0.340	0.307	0.904	39
Selected High Open50+ Male Occupations:								
Recreation workers	589	50	28	19	0.105	0.314	2.985	40
Protective service occupations, n.e.c.	851	43	20	16	0.062	0.140	2.252	48
Athletes	1,054	47	27	18	0.069	0.112	1.613	38
Food counter, fountain and related occupations	1,869	28	18	16	0.014	0.019	1.383	36
Selected High CV(Age) Male Occupations:								
News vendors	1,225	57	22	16	0.153	0.068	0.441	56
Sales workers, apparel	1,585	61	24	17	0.162	0.131	0.811	53
Parking lot attendants	876	65	29	19	0.235	0.242	1.028	49
Attendants, amusement and recreation facilities	2,320	58	28	17	0.159	0.106	0.662	49
Cashiers	9,381	50	22	17	0.101	0.055	0.542	49
Stock handlers and baggers	15,598	41	20	16	0.065	0.031	0.476	49
Selected Young P10 Male Occupations:								
News vendors	1,225	57	22	16	0.153	0.068	0.441	56
Stock handlers and baggers	15,598	41	20	16	0.065	0.031	0.476	49
Miscellaneous food preparation occupations	7,258	46	21	16	0.082	0.059	0.719	47
Food counter, fountain and related occupations	1,869	28	18	16	0.014	0.019	1.383	36
Cashiers	9,381	50	22	17	0.101	0.055	0.542	49
Cooks	19,874	43	23	17	0.062	0.029	0.467	42

Table 1 (continued) Descriptive Statistics on Male Age Structure and Female Age Structure for Selected Occupations, 1983-95.

Occupation	*N*	*P90*	*P50*	*P10*	*Age 50+*	*Hire 50+*	*Open 50+*	*CV (Age)*
Selected Low Hire50+ and Open50+ Male Occupations:								
Physicians' assistants	690	44	32	24	0.029	0.000	0.000	24
Drillers, earth	327	50	31	22	0.116	0.000	0.000	32
Data-entry keyers	1,291	49	29	20	0.100	0.000	0.000	36
Carpenter apprentices	183	31	21	18	0.016	0.000	0.000	29
Selected Low CV(Age) Male Occupations:								
Supervisors, police and detectives	1,762	52	42	32	0.163	0.019	0.120	19
Administrators, education and related field	6,288	58	45	33	0.349	0.144	0.412	22
Personnel and labor relations managers	1,185	55	42	30	0.262	0.141	0.540	23
Airplane pilots and navigators	1,927	54	41	29	0.207	0.056	0.272	23
B. Women								
All Women	1,104,886	55	35	23	0.187	0.102	0.537	34
Selected Large Female Occupations:								
Secretaries	86,450	56	37	23	0.200	0.100	0.499	33
Cashiers	44,555	52	25	17	0.123	0.065	0.524	45
Managers and administrators, n.e.c.	42,464	55	37	25	0.180	0.085	0.471	30
Registered nurses	36,573	55	38	26	0.187	0.110	0.589	27
Bookkeepers, accounting, and auditing clerk	35,623	58	38	24	0.245	0.142	0.577	33
Teachers, elementary school	30,398	55	40	27	0.203	0.051	0.251	25
Nursing aides, orderlies, and attendants	29,763	58	38	22	0.233	0.141	0.606	34
Waiters and waitresses	27,522	48	26	18	0.089	0.043	0.478	40
Sales workers, other commodities	23,554	60	32	18	0.232	0.142	0.615	45
Selected Old P90 Female Occupations:								
Cooks, private household	294	71	56	28	0.619	0.509	0.822	30
Musicians and composers	827	69	42	23	0.366	0.255	0.697	38
Demonstrators, promoters and models, sales	696	68	47	20	0.460	0.311	0.676	40
Private household cleaners and servants	10,273	67	47	26	0.455	0.300	0.659	33
Crossing guards	735	67	46	32	0.424	0.338	0.797	28
Welfare service aides	1,973	65	44	25	0.381	0.365	0.957	32
Religious workers, n.e.c.	1,010	64	44	27	0.352	0.101	0.288	31
Selected High Hire50+ Female Occupations:								
Cooks, private household	294	71	56	28	0.619	0.509	0.822	30
Housekeepers and butlers	664	68	48	25	0.461	0.447	0.971	32
Postmasters and mail superintendents	614	63	49	35	0.497	0.444	0.894	22
Clergy	618	62	44	29	0.353	0.388	1.100	28
Selected High Open50+ Female Occupations:								
Actuaries	122	43	30	23	0.025	0.093	3.801	25
Sales workers, motor vehicles and boats	435	48	34	21	0.080	0.178	2.215	31
Protective service occupations, n.e.c.	933	40	19	16	0.061	0.113	1.853	47
Selected High CV(Age) Female Occupations:								
Ushers	147	57	19	16	0.136	0.268	1.970	57
Child care workers, private household	8,278	56	22	16	0.144	0.119	0.824	54
Sales workers, apparel	8,483	61	26	17	0.227	0.150	0.662	50
Food counter, fountain and related occupations	6,117	37	18	16	0.044	0.027	0.610	47
Sales workers, other commodities	23,554	60	32	18	0.232	0.142	0.615	45
Cashiers	44,555	52	25	17	0.123	0.065	0.524	45
Selected Young P10 Female Occupations:								
Child care workers, private household	8,278	56	22	16	0.144	0.119	0.824	54
Food counter, fountain and related occupations	6,117	37	18	16	0.044	0.027	0.610	47

Table 1 (continued) Descriptive Statistics on Male Age Structure and Female Age Structure for Selected Occupations, 1983-95.

Occupation	*N*	*P90*	*P50*	*P10*	*Age 50+*	*Hire 50+*	*Open 50+*	*CV (Age)*
Sales workers, shoes	1,549	54	22	17	0.138	0.126	0.910	49
Waiters'/waitresses' assistants	3,483	57	29	17	0.183	0.113	0.620	48
Stock handlers and baggers	5,167	53	28	17	0.135	0.102	0.758	44
Farm workers	2,739	53	31	17	0.137	0.107	0.786	40
Selected Low Hire50+ and Open50+ Female Occupations:								
Mechanical engineers	283	44	29	23	0.060	0.000	0.000	29
Photographers	503	43	28	19	0.052	0.000	0.000	34
Announcers	234	43	28	18	0.043	0.000	0.000	34
Dancers	270	33	25	20	0.000	0.000	n.a.	21
Selected Low CV(Age) Female Occupations:								
Railroad brake, signal, and switch operator	20	43	37	26	0.050	0.079	1.574	18
Social work teachers	34	57	44	34	0.324	0.000	0.000	19
Law teachers	44	47	38	27	0.068	0.000	0.000	19
Metallurgical and materials engineers	34	40	32	25	0.029	0.000	0.000	20

N is the sample size from the 1983-95 CPS-ORG earnings files.
All variables in panel A are calculated for men and in panel B for women. For variable definitions and sources, see the appendix.

Table 2. WLS Regression Results:
Determinants of Male and Female Occupational Age Structures.

	Age 50		Hire 50+		Open 50+		CV(Age)	
Variable	Coeff.	t	Coeff.	t	Coeff.	t	Coeff.	t
			A. Men					
ln(Wage)	0.078	2.87	0.085	3.38	0.223	2.11	-9.073	-8.79
$\partial \ln W / \partial \ln Exp$	-0.347	-4.55	-0.466	-6.65	-1.109	-3.77	-1.126	-0.39
Pension	0.306	4.65	0.055	0.91	-0.640	-2.52	-10.973	-4.43
Health	0.014	0.22	0.106	1.75	0.362	1.42	3.915	1.58
Schooling	0.008	1.81	0.009	2.07	0.033	1.85	0.104	0.59
Firm Training	-0.077	-2.82	-0.044	-1.76	0.032	0.30	-4.065	-3.94
Computer	-0.156	-6.29	-0.132	-5.78	-0.345	-3.61	2.744	2.93
Numerical	-0.033	-3.44	-0.033	-3.75	-0.070	-1.89	1.413	3.89
Shift Work	-0.023	-1.09	-0.006	-0.29	-0.039	-0.48	-1.488	-1.86
Overtime	0.066	2.20	0.031	1.13	-0.028	-0.25	-5.361	-4.76
Part-time	0.106	1.88	0.076	1.46	0.073	0.33	10.838	5.09
Flex-time	0.068	1.91	0.020	0.61	-0.127	-0.93	-0.977	-0.73
Strength	-0.002	-0.22	-0.010	-1.18	-0.030	-0.88	0.799	2.41
Environmental	-0.026	-3.20	-0.026	-3.47	-0.075	-2.37	0.023	0.07
Hazards	0.022	1.15	0.054	2.99	0.219	2.92	-0.573	-0.78
Physical Demands	0.009	1.26	0.008	1.24	0.010	0.39	-0.528	-2.06
Work Outdoors	0.004	0.29	0.017	1.41	0.066	1.29	1.507	3.00
Union	-0.156	-4.84	-0.174	-5.85	-0.403	-3.24	-3.032	-2.49
Large Firm	-0.010	-0.33	-0.004	-0.13	0.087	0.71	2.660	2.22
Employment Growth	-0.031	-4.11	-0.011	-1.62	0.010	0.33	-0.528	-1.86
Constant	-0.054	-0.79	-0.105	-1.68	0.073	0.28	54.988	21.44
Dependent Var. Mean	0.191		0.101		0.529		32.813	
R-square	0.381		0.257		0.233		0.882	
N	497		497		493		497	
			B. Women					
ln(Wage)	0.056	2.02	0.031	1.40	-0.017	-0.19	-16.295	-14.48
$\partial \ln W / \partial \ln Exp$	-0.244	-2.23	-0.338	-3.81	-1.189	-3.23	-3.546	-0.80
Pension	0.372	5.97	0.155	3.09	-0.332	-1.59	-13.997	-5.53
Health	-0.131	-1.81	-0.016	-0.27	0.264	1.08	4.498	1.53
Schooling	-0.032	-6.57	-0.022	-5.54	-0.012	-0.72	1.843	9.46
Firm Training	-0.039	-1.32	-0.012	-0.52	0.073	0.75	-4.143	-3.49
Computer	-0.068	-3.30	-0.063	-3.79	-0.101	-1.48	3.602	4.32
Numerical	0.000	0.06	0.001	0.11	0.006	0.22	0.232	0.72
Shift Work	-0.100	-4.43	-0.077	-4.22	-0.082	-1.09	1.835	2.00
Overtime	0.129	2.42	0.090	2.10	0.134	0.75	-3.156	-1.46
Part-time	0.152	3.21	0.113	2.97	0.058	0.37	2.256	1.18
Flex-time	0.166	4.84	0.140	5.08	0.151	1.32	-5.361	-3.86
Strength	0.005	0.61	0.003	0.47	0.001	0.05	-0.316	-1.05
Environmental	0.005	0.35	-0.002	-0.15	-0.013	-0.27	-0.267	-0.46
Hazards	0.001	0.03	0.014	0.57	0.034	0.33	1.514	1.20
Physical Demands	-0.001	-0.13	0.000	0.01	-0.001	-0.04	0.604	2.52
Work Outdoors	-0.052	-3.03	-0.021	-1.55	0.011	0.20	0.049	0.07
Union	0.037	1.04	-0.019	-0.67	-0.231	-1.94	-5.440	-3.76
Large Firm	-0.140	-5.18	-0.085	-3.90	0.001	0.01	11.654	10.65
Employment Growth	-0.007	-1.65	-0.004	-1.08	-0.002	-0.18	-0.049	-0.30
Constant	0.449	9.11	0.305	7.65	0.812	4.94	44.970	22.45
Dependent Var. Mean	0.187		0.102		0.537		33.501	
R-square	0.379		0.386		0.206		0.870	
N	494		494		463		494	

All variables are defined at the Census detailed occupational level. Apart from the *DOT* measures, all variables in Panel B are calculated based on female-only samples.
For variable definitions and sources, see the appendix.

Table 3. Gini Measures of Occupational Segregation

Group	1983	1987	1991	1996	1998
Men:					
Older New Hires	.397	.359	.416	.390	.370
Young New Hires	.240	.230	.228	.236	.250
Older Workers	.276	.276	.290	.289	.307
Women:					
Older New Hires	.350	.355	.357	.349	.315
Young New Hires	.226	.200	.195	.226	.211
Older Workers	.275	.252	.273	.250	.250

Data sources are CPS Supplements for January 1983, January 1987, January 1991, February 1996, and February 1998. There are 346 occupational cells for males and 269 for females. The Gini index *G*) ranges from 0 (no segregation) to 1 (complete segregation). The Gini index of occupational segregation is described in the text and in Figure 1.

Appendix

Variable Definitions and Sources

Variable	*Definition*	*Source*
Age Discrimination and Access Measures		
P90	Age at the 90th percentile of the age distribution	CPS-ORG, 1983-95.
P50	Age at the 50th percentile of the age distribution.	CPS-ORG, 1983-95
P10	Age at the 10th percentile of the age distribution	CPS-ORG, 1983-95
Age 50+	Proportion of workers who are age 50 or over.	CPS-ORG, 1983-95
CV(Age)	Coefficient of variation of the age distribution (100 times the standard deviation divided by the mean).	CPS-ORG, 1983-95.
Hire50+	Proportion of workers with 5 years or less of company tenure who are ages 50 and over.	Six CPS supplements containing information on company tenure: January 1983, May 1983, January 1987, May 1988, January 1991, and April 1993.
Explanatory Variables		
Open 50+	Ratio *Hire50+/Age50+*	
Ln(Wage)	Mean of log wage in 1995 dollars	CPS-ORG Male W&S, 1983-95.
$\partial \ln W / \partial \ln Exp$	Wage equation regression coefficient on log of potential experience (Age-Schooling-6), estimated by occupation. Schooling and other premarket control variables included in the regression. Represents wage-experience elasticity.	CPS-ORG Male W&S, 1983-95.
Pension	Proportion with employer-provided pension coverage.	March CPS, Male W&S, 1983-95.
Health	Proportion with employer-provided health insurance.	March CPS, Male W&S, 1983-95.
Schooling	Mean years of schooling completed.	CPS-ORG Male W&S, 1983-95.
Firm Training	Proportion of workers receiving company-provided training.	CPS-Supplement, Male W&S, January 1983 and January 1991.
Computer	Proportion of workers using computer on the job.	CPS-Supplement, Male W&S, October 1984 and October 1989.
Numerical	Numerical aptitude required for job. Rescaled to range from 0 (low aptitude) to 4 (high aptitude).	*DOT* (England and Kilbourne, 1988).
Shift Work	Proportion of workers whose work shift is not during the day (i.e., sum of evening, night, irregular, and rotating shift).	CPS-Supplement, Male W&S, May 1985 and May 1991.
Overtime	Proportion working long hours (greater than 42 hours per week).	CPS-ORG Male W&S, 1983-95.
Part-time	Proportion working part-time (less than 35 hours per week).	CPS-ORG Male W&S, 1983-95.
Flex-time	Proportion whose work schedule allows them to vary the times at which they arrive and depart from work.	CPS-Supplement, Male W&S, May 1985 and May 1991.
Strength	Index of r`equired strength in occupation, ranging from 1 (sedentary) to 5 (very heavy).	*DOT* (England and Kilbourne, 1988).
Environment	Number of severe non-weather environmental conditions, from 0 to 5 (cold, heat, wet, noise, atmosphere).	*DOT* (England and Kilbourne, 1988).
Hazards	Proportion of jobs within CPS occupation involving significant hazard.	*DOT* (England and Kilbourne, 1988).
Physical Demands	Number of physical demands (significant climbing, stooping, reaching, seeing), from 0 to 4.	*DOT* (England and Kilbourne, 1988).
Work Outdoors	Proportion of jobs where significant amount (at least 25%) of work is outdoors (combines DOT variables for outdoors and both indoors/outdoors).	*DOT* (England and Kilbourne, 1988).
Union	Proportion of workers covered by collective bargaining agreement.	CPS-ORG Male W&S, 1983-95.
Large Firm	Proportion of workers in firms with 1,000+ employees.	March CPS, Male W&S, 1989-95.
Employment Growth	Ratio of 1994/95 to 1983/84 employment.	CPS-ORG Male W&S, 1983/84, 1994/95.

N is the sample size from the 1983-95 CPS-ORG earnings files.