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Keywords

labor market, employer, job, worker, opportunities, hire, employee, wage, United States

Disciplines

Human Resources Management | Labor Economics | Labor Relations

Comments

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Job Opportunities For Older Workers:
When Are Jobs Filled With External Hires?*

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February, 2006

Abstract

This paper examines why firms sometimes employ older workers, but tend to not hire new older workers for the same job. It focuses on one aspect of that phenomenon: the propensity for firms to fill jobs from the inside rather than hire someone new from the outside. Using a survey of establishments with information on a white collar job currently held by an older worker, the paper tests hypotheses on what types of jobs are likely to be filled from the outside. Several of the results point to the potential importance of asymmetric information, whereby the firm has better information on key characteristics of insiders versus outsiders.

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Job Opportunities for Older Workers: When Are Jobs Filled with External Hires?

Any assessment of job opportunities for older people must grapple with employer hiring behavior. Employers seem to avoid hiring *new* older workers for jobs that older workers can obviously do. In the event of a job opening, the employer either shifts a current employee (young or old) into the job, or hires a new young worker. Why do employers behave this way?

This type of employer behavior is a problem because it can lead to a labor market with restricted job opportunities for older workers. In fact, there is evidence of such restricted opportunities. Consider the effects of job loss. In the United States workers over age 55 are somewhat less likely to become unemployed than workers below this age, yet compared to the young these older workers “have the lowest reemployment probabilities, the longest time to reemployment, high probabilities of part-time employment, and the largest wage losses.”¹ Indeed, Chan and Stevens (2001) find that for displaced workers (for example, workers who lost their job due to a plant closing) “four years after job losses at age 55, the employment rate of displaced workers remains 20 percentage points below the employment rate of similar nondisplaced workers.” Even after controlling for a list of factors that influence labor supply (e.g., marital status, pensions, wealth holdings), Chan and Stevens find lower employment rates for older displaced workers. A plausible interpretation would be: if you lose your job when you are in your fifties or sixties, it can be difficult to find similar work. You may be better off simply going into retirement.

A similar phenomenon occurs in Japan. According to a recent OECD study, the incidence of long-term unemployment rises with age in Japan. Among unemployed persons over age 50 (60) in 2002, the fraction who had been unemployed for more than a year was 36.1 (39.6)

percent. The comparable number at age 25 – 49 was 29.9 percent (OECD, 2004, Table 2.5).

Moreover, there is evidence that during the 1990s, reduced demand combined with an increase in the age of mandatory retirement from 55 to 60 contributed to reduced employment of older (age 60 – 64) wage and salary workers (Mitani, 2002).

From a policy perspective, restricted job opportunities are a major concern. In the United States the fraction of the population age 50 and older is destined to increase from 30% to 36% over the next 30 years.² This has led to calls for policies that expand labor force participation of older Americans. Not only will later retirement reduce financial pressure on the U.S. social security system, but it could conceivably address labor market shortages arising from smaller numbers of young workers.³ A similar phenomenon is occurring in Japan. The fraction of the labor force over age 50 is destined to grow, and efforts are underway to institute policies that encourage increase labor force participation in the older population.⁴ Certainly one way to bring about this increase is through enhanced job opportunities for older workers, and the governments of both the United States and Japan are currently pursuing that goal.

This paper uses new data on jobs in a sample of establishments to examine employer hiring behavior. By studying hiring behavior we gain a better understanding of why some jobs seem to be closed to older workers, and thereby a better understanding of job opportunities for older workers.

For purposes of studying hiring of older workers, a survey of establishments has both advantages and disadvantages. A key advantage is that such data can provide information on employer policies, and those policies can then be related to characteristics of the workplace. At least in the United States, a disadvantage to establishment level data is that it may be difficult to obtain truthful answers to questions about hiring older workers. For example, one would like to

ask an employer whether he or she is willing to hire a 55 year old worker for a specific job. Due to laws regarding age discrimination, an employer in the U.S. may hesitate to say anything but “yes” to such a question. While the firm may, in reality, avoid hiring older workers, no spokesperson for the firm would actually *say* that in an interview. Such an answer could conceivably be interpreted as indicating age discrimination, and thereby somehow used in a law suit.

This paper avoids the problem of less than truthful responses by focusing on whether the firm fills a specific job from the “inside” or the “outside.” Employers can candidly discuss this topic without fear of age discrimination law suits. An employer fills a job from the inside when an existing employee is promoted or shifted into the job. A job is filled from the outside when a new worker (young or old) is hired into the job.

This paper contributes to the literature by (a) presenting evidence indicating that older workers often hold jobs that are simply not filled from the outside, and (b) testing hypotheses for why that is. Thus, one reason why there are jobs for which firms employ but do not hire older workers is that the firms do not hire *any* outside worker for those jobs. While there may be qualified outsiders (both young and old) who could do the job, that opportunity never arises. The job is only open to insiders.

I. The Literature.

Much of the economic literature on barriers to hiring older workers is built on the concept of quasi-fixed costs. In a classic article, Walter Oi argued that the labor input is quasi-fixed, i.e., its total cost is partially variable and partially fixed.

The total discounted costs, C , of hiring an additional worker is the sum of the present value of expected wage payments, the hiring cost, H , and training expense, K .

$$(1) C = \sum_0^T W_t (1+r)^{-t} + H + K,$$

where W_t is the expected wage in the t-th period, r denotes the rate at which future costs are discounted, and T denotes the expected period of employment. (Oi 1962, p. 539).

Firms that have large fixed costs -- such as Oi's hiring and training costs -- will tend to employ but not hire older workers. To see this, consider a world where a new generation of Z income maximizing workers enters the workforce every period. The members of each generation work for two periods and retire. Assume these workers are equally productive, that productivity does not grow over the life-cycle, and that young and old are perfect substitutes in production. Thus, at any point in time there are 2Z equally productive workers in the labor market, Z of whom are young workers in their first period of work, and Z of whom are older workers.

To begin with, assume that all firms in this market have zero fixed costs; wages are their only labor cost. Such firms and workers would presumably form a spot market, since neither has reason for a long-term relationship. Moreover, since old and young workers are equally productive and impose no fixed costs on the firms, the wages of young and old will be equal and firms will be indifferent between hiring one or the other.

Now suppose that a new firm, which perhaps produces a different product, enters this competitive labor market. This firm incurs fixed cost F each time it hires a worker. For example, in Oi's framework above, F is the sum of hiring and training costs. If it hires old workers it pays F every period. If it hires young workers and retains them for their full two period work-life, it only pays F every other period. Since young and old are paid the same wage, this firm minimizes costs by only hiring young workers. This is true even if young and old are equally productive and perfect substitutes in production. Although the firm employs old workers -- workers who were young when hired and are completing the second period of their work life -- it does not hire them.

The idea that fixed costs lead the firm to avoid hiring older workers is central to the theoretical argument in Hutchens (1986). That paper argues that delayed payment contracts – contracts that discourage worker shirking and malfeasance by shifting compensation to the end of the contract – create a form of fixed cost. Much as with the hiring and training costs in Oi (1962), these fixed costs lead firms to primarily hire young (long-term workers). After making that argument, Hutchens (1986) presented empirical evidence that was largely based on an index of the form,

$$I(i,j) = \frac{\% \text{ of recently hired workers in industry } i \text{ and occupation } j \text{ that are over age } k}{\% \text{ of all workers in industry } i \text{ and occupation } j \text{ that are over age } k}$$

where age k was set at 55. Small values of the index reveal jobs that employ but do not hire older workers. The paper finds that jobs with small values of the index tend to have the characteristics of delayed payment contracts, i.e., long tenure with the firm, pensions, mandatory retirement, and high wages for older workers.

The subsequent empirical literature is largely consistent with the result in Hutchens (1986). Heywood, Ho, and Wei (1999) use data from establishments in Hong Kong to test the hypothesis that delayed payment contracts are associated with establishments that employ but do not hire older workers.⁵ They compute the above index with age k set at 35 for each establishment, and take that as their dependent variable in multivariate models. They find that establishments with pensions, and lengthy job tenures tend to have lower values of the index. Similarly, in a study that provides some of the most comprehensive empirical work on the topic, Hirsch, MacPherson and Hardy (2000) examined data on occupations in the U.S. After pooling data on 494 detailed occupations in a series of Current Population Survey data sets from the period 1983 – 1998, these authors set age k at 50, compute the above index for each occupation,

and use that as their dependent variable in multivariate models. Their analysis indicates that, among other things, occupations with pensions and steep wage profiles tend to employ but not hire older workers.

Another branch of the literature on hiring older workers is built on the idea of fixed costs, but unlike the above (and like Oi, 1962) focuses on hiring and training costs. For example, Hu (2003) not only argues that specific training is a form of fixed cost, but that such investments increase with firm size. This leads to the prediction that larger firms will tend to hire relatively young workers. Another example is Scott, Berger, and Garen (1995) who argue that health insurance and pensions create a form of fixed costs. Although their theory is more complicated than the above, they too predict that an increase in such fixed costs will cause the firm to increase hiring of young workers.

These predictions regarding training and health insurance receive a degree of empirical support. Hu (2003) draws data on white collar workers in the U.S. from the Current Population Survey, and finds that other things equal, larger firms tend to hire younger workers. Heywood et. al. (1999) find that establishments with more skilled workforces tend to employ but not hire older workers. In both cases the authors interpret their results as potentially linked to the effect of specific training. With regard to health insurance, Scott et. al. (1995) obtain the result that presence of employer provided health insurance tends to decrease hiring of workers between ages 55 and 64. However, Hirsch et. al. (2000) find essentially no support for that.

Finally, it is important to acknowledge that not all empirical results in the literature can be explained in terms of fixed costs. For example, Hirsch, et. al. (2000) find that occupations where employees often use computers tend to employ but not hire older workers. While that

could conceivably be due to fixed costs (e.g., specific training), there is no way to know whether that is the case.

II. Theory and Hypotheses

It is useful to think about the probability that an employer hires a new older worker in terms of two decisions. The first decision is whether or not to fill the job with a new hire from the outside, i.e., fill the job with a worker of any age not currently employed by the firm. The second decision is conditional on the first: given that the firm fills the job with a new hire from the outside, does the firm hire an older worker? As such, one can write the probability of hiring a new older worker into job j as the product of a marginal probability and a conditional probability, i.e.,

$\Pr(\text{OHire in } j) = \Pr(\text{OHire in } j \mid \text{Hire in } j) \Pr(\text{Hire in } j)$, where

$\Pr(\text{OHire in } j)$ is the probability of hiring an outside older worker into job j

$\Pr(\text{Hire in } j)$ is the probability of hiring an outside worker (young or old) into job j , and

$\Pr(\text{OHire in } j \mid \text{Hire in } j)$ is the probability of hiring an outside older worker conditional on hiring an outside worker into job j .

The economic theory that underlies much of the empirical literature on hiring older workers primarily focuses on the conditional probability, $\Pr(\text{OHire in } j \mid \text{Hire in } j)$. Indeed, the argument about fixed costs in the above Section I takes that form; assuming a firm fills a job from the outside, what effect do fixed costs have on the firm's propensity to hire old versus young workers? That question and the theory that addresses it are the basis for the empirical work in Hutchens (1986), Heywood et. al. (1999), Scott et. al. (1995), and Hu (2003).

This focus on the conditional probability is somewhat troubling. Several authors have used firm level personnel records to show that some jobs are more likely to be filled from the inside than others.⁶ A firm may employ but not hire an older worker for a specific job simply because it does not hire outside workers – young or old – for the job. Alternatively stated, one good reason why $\Pr(\text{OHire in } j)$ may differ across jobs is that the marginal probability, $\Pr(\text{Hire in } j)$, differs across jobs. This section considers theoretical arguments for why some jobs may or may not be filled with an outside hire. This is, of course, linked to the subsequent empirical work.

A good place to start is to examine the extent to which the above ideas about fixed costs provide an explanation for why some jobs are filled with an outside hire. Consider the argument in the opening paragraphs of Section I. Once again, assume that a new firm enters a labor market populated by firms that use a technology whereby young and old are perfect substitutes in production, and that have no fixed costs. As before, each new generation of Z workers is available to work for two periods, and workers are identical in all respects except that some entered the labor market in the current period (the young) while others entered in the previous period (the old).

Now, unlike Section I, suppose that the new firm employs $N+1$ workers in a hierarchy involving two types of jobs. One type of job is called a “regular” job or R-job; both young (first period) and old (second period) workers are equally productive in this job. Assume the firm employs N workers in R-jobs. The second type of job is called a “management” job or M-job; old workers are more productive than young workers in this job.⁷ The firm has only one M-job. Assume that the firm’s technology is such that vacancies in either type of job are quite costly to the firm; thus in every period the firm employs one manager and N “regular” employees. The

firm's problem is to decide whether to fill its $N+1$ jobs with inside or outside workers. In particular, if it fills some or all of the R-jobs with young workers in period $t-1$, then the firm has the option of "promoting" one of those workers into the M-job in period t . When will the M-job be filled from the inside, and when will it be filled with an outside hire?

To begin with, we wish to examine whether the above ideas about fixed costs provide an explanation for why some jobs are filled from the inside. Suppose this firm incurs a fixed cost F_R (F_M) when a worker starts the R-job (M-job). For example, the fixed cost could be a form of specific training that is useful in that job. Would such fixed costs affect the firm's propensity to promote its previous period's R-job worker to the M-job? Generally speaking, the answer is "no." For example, suppose both F_R and F_M are positive and F_M is independent of F_R . Then to promote a previous period's R-job worker into the M-job implies costly turnover in the R-job; to minimize the cost of R-job workers, the firm should always hire young workers into the R-job and retain them in that job for two periods.⁸

Of course, there is a case where fixed costs can cause the firm to fill the M-job from the inside. This case arises when F_M for outsiders is larger than F_M for insiders. For example, suppose that $F_M = \theta$ for a worker hired from the outside, while $F_M \leq \theta - F_R$ if a previous period's R-job worker is promoted to the M-job. This could happen if specific training costs incurred in the R-job reduce similar costs in the M-job. In this case a promotion can be less costly than an outside hire, and the cost-minimizing firm will thereby avoid the outside hire. Thus, in this case fixed costs influence the above marginal probability, $\Pr(\text{Hire in } j)$.

Is this a realistic case? Is it, for example, realistic to assume that the cost of training an insider to do a management job is substantially less than the cost of training an outsider for the same job? Since the answer is not obvious *a priori*, view this as an interesting hypothesis. Thus,

Hypothesis 1: Jobs with large fixed costs, such as specific training, are particularly likely to be filled from the inside, *ceteris paribus*.

Another reason why a firm may prefer insiders to outsiders is that a job requires some difficult to observe worker characteristic, and the firm's information on that characteristic is asymmetric in the sense that its information is better for insiders than for outsiders. To see this, suppose that workers are heterogeneous in a characteristic "A" that is productive in the M-job but not in the R-job. For example, A could represent leadership skills, integrity, or a capacity for intense work. Assume that the firm can not observe A when hiring from the outside; for outsiders the firm only knows $E(A)$, the expected value of A. The firm can, however, obtain accurate information on A_i – the value of A for individual i – by observing the worker in the R-job for one period. Thus, by observing its regular workers the firm can determine whether a worker is an effective leader, is trustworthy, or tends to shirk. In this case, given N young workers in the R-job in period t-1, a risk neutral firm will prefer to fill the M-job with an insider when $Max_{i=1,N} \{A_i\} > E(A)$. Thus, due to asymmetric information, insiders may be preferred to outsiders.

An important and growing literature examines employer behavior when the employer has better information on insiders versus outsiders. At the heart of this literature lies the firm's assignment problem. The firm has different jobs with different skill requirements, and workers are heterogeneous in their skills. The firm's problem is to assign workers to jobs so as to maximize profit. If the firm has complete information on the characteristics of inside and outside workers, then there is no preference for insiders. If, as is more likely, the firm has better information on the characteristics of inside workers, then vacancies are likely to be filled from

the inside. Much of the recent theoretical work on job assignment and promotion assume this type of asymmetric information (see Valsecchi (2000) for a useful review), but only a handful of articles explicitly consider outside hires, and they do not provide guidance on the types of jobs that are likely to be filled from the inside.⁹

One set of jobs where informational asymmetries may be particularly important are jobs with delayed payment contracts. Suppose the firm has a job in which worker shirking and malfeasance is particularly costly to the firm. Consistent with Lazear (1979, 1981), in order to discourage such behavior, the firm uses delayed compensation. Suppose, in addition, that workers are heterogeneous in their propensity to shirk or steal from the firm, i.e., some workers are more likely to shirk or steal than others. Since delayed payments are costly to the firm (Hutchens, 1986), the firm can both reduce the cost of delayed payments as well as the likelihood of shirking and malfeasance by filling the job with a particularly honest and hard-working employee.¹⁰ If there are informational asymmetries whereby the firm has better information on insiders than outsiders (if information on the propensity to shirk or steal takes the form of the variable *A* above), then the best worker for a job with a delayed payment contract may well be an insider.¹¹ For purposes of the subsequent empirical work it is useful to state this as a hypothesis.

Hypothesis 2: Jobs with the characteristics of delayed payment contracts, such as defined benefit pensions, high wages, and long job-tenures, are particularly likely to be filled from the inside, *ceteris paribus*.

Asymmetries in the firm's information on insiders versus outsiders also imply a hypothesis about the size of the firm. To see this, consider two firms. The first firm – the small firm – has one M-job and one R-job. The second firm – the large firm – has one M-job and 100 R-jobs. Both fill the M-job with an insider when $\text{Max}_{i=1,N} \{A_i\} > E(A)$. Other things equal, this condition is less likely to be met in the small firm. When the small firm observes A_i for its one R-job worker, it may be disappointed. The worker's ability to do the M-job may be so low that the firm would rather fill the M-job with an outside worker of unknown ability; a random draw from the outside would be better than promotion of an untalented insider. This is less likely for the large firm, since it has more employees in the R-job. In a sense the large firm has more chances at finding an R-job employee who can perform well in the M-job. Thus, given informational asymmetries, large firms are less likely to fill jobs from the outside, *ceteris paribus*.

Of course, firm size may also influence fixed costs and the presence of delayed payment contracts. Large firms tend to have higher survival probabilities than small firms (Idson, 1996), and long-term relationships are thereby more feasible in large firms. Consequently, jobs involving fixed costs and delayed payment contracts should be more likely to arise in large firms. The point of the above argument is that firm size should have an independent effect on whether a job is filled with an outside hire. Even after controlling for fixed costs and delayed payment contracts, larger firms should be more likely to fill jobs from the inside. Thus, the hypothesis,

Hypothesis 3: Jobs in large firms are more likely to be filled from the inside than jobs in small firms, *ceteris paribus*.

An empirical test of the third hypothesis is reasonably straightforward. One simply needs a measure of firm size. The subsequent empirical work uses information on the number of employees in the establishment as well as the larger organization. The other two hypotheses require proxies for fixed costs as well as delayed payment contracts. Since the hypotheses will be tested in data on jobs from a survey of establishments, that requires some discussion.

A test of the first hypothesis requires proxies indicating whether or not a job involves fixed costs. Here we focus on a particularly important form of fixed costs: specific training. Three proxies will be used to indicate whether a job involves specific training: the number of months required for a newly hired worker to learn the job, whether the job rarely involves employer sponsored training, and whether the person who currently fills the job has skills that are easily transferred to other organizations. All of these variables are described in the subsequent section. Consistent with the first hypothesis, firms should be more likely to hire an outsider into a job that is quickly learned, that involves little employer sponsored training, and that requires skills that are easily transferred to other employers.

A test of the second hypothesis requires proxies for delayed compensation. Three proxies drawn from information on the person who currently fills the job are used here. Specifically, the length of the person's tenure with the firm, whether the person has a defined benefit pension, and the person's wage. Consistent with the second hypothesis, larger values of these variables are expected to be associated with a lower likelihood of hiring an outsider into the job.¹² Of course, while these variables may reveal the presence of delayed compensation, they do not speak to the question of whether the delayed compensation is due to shirking and malfeasance, as depicted by Lazear (1979, 1981). For example, a longer tenure with the firm and a higher wage could conceivably be due to specific training. The same issue is discussed in Hutchens (1986, 1987).

III. The Data

Unlike much of the previous research on hiring older workers, the present paper uses data from establishment interviews. Thanks to a grant from the Sloan Foundation, between June 2001 and November 2002, the University of Massachusetts Center for Survey Research conducted telephone interviews in a representative sample of 950 establishments in the continental US on the topic of phased retirement by white collar workers. Hutchens and Grace-Martin (2004) use these data to analyze why establishments differ in their policies toward phased retirement. This paper uses the same survey to examine employer hiring behavior.

At the outset it is useful to define an establishment. An establishment is a single physical location at which business is conducted or services or industrial operations are performed. An establishment may or may not be part of a larger organization (like a business with several addresses). For purposes of studying hiring behavior, establishment level data is arguably better than data collected from the larger organization. In contrast to (say) a survey of upper-level executives at corporate headquarters, establishment level respondents are more likely to know how policy is actually implemented. In order to obtain detailed information in a relatively brief interview, the survey focused on white-collar workers. The sample was restricted to establishments not engaged in either agriculture or mining with twenty or more employees and at least two white-collar employees who are age 55 or more. The latter restriction insures that questions about phased retirement are relevant to the establishment's current situation.¹³

The sample universe was the Dun and Bradstreet Strategic Marketing Record for December 2000. This is a comprehensive listing of establishment addresses in the United States. The main source of these data is credit inquiries, although information is also obtained from the U.S. Postal

Service, banks, newspapers, yellow pages, and other public records.¹⁴ In order to insure adequate numbers of large establishments, the sample was stratified by establishment size.

The survey was conducted by telephone. The survey research firm first contacted the establishment and asked for the person who is best able to answer questions about flexible work schedules and employee benefits, for example a human resource manager or benefits manager. Interviews were conducted with a CATI (Computer Assisted Telephone Interviewing) system, thereby permitting an interview to be completed over several phone calls. Although this technology simplified the interview process, new technologies on the respondent side (in particular answering machines) complicated matters. The median number of telephone calls to complete an interview was 10, with 10% of the interviews requiring 30 or more calls to complete.

The overall response rate was 61%. Most of the unit nonresponse occurred when screening establishments for eligibility (e.g., at least two white collar employees age 55+), and before respondents knew the purpose of the survey. Interviews were completed in 89% of the establishments that were successfully screened. This is on a par with other establishment level telephone surveys.

After asking a series of question about the characteristics of the establishment and its human resource and pension policies, the interviewer proceeded as follows:

So far, we have been talking about general policies at your establishment. I'd now like to ask about more specific situations. In order to answer these questions, it is easiest to talk about an actual person who does an actual job in your establishment.

To begin with, I would like you to give me the first names of three [men/women] age 55 or over who are full-time white-collar employees in your establishment. If it would make you more comfortable, you can give me fictitious names, but please think of specific employees. You should know the work of these employees reasonably well. For example, they may be people you supervise. If possible, it would be best if these three employees have different job titles.

This question was randomized on gender. Roughly half of the employers were asked for three men, while the other half were asked for three women.¹⁵

Given the three first names, we then randomly selected one of the names and asked questions about the characteristics of the selected worker, the nature of that worker's job, and what the firm would do if the worker left. Particularly important for the present paper is following question, subsequently denoted as Q1:

Q1. If [NAME] were to leave her/his job, we'd like to know how likely it is that the job would be filled with a new hire, as opposed to someone already employed by your establishment. On a scale from 1 to 5 where 1 means not at all likely and 5 means very likely, how likely is that that [NAME]'s job would be filled with a new hire?

1. Not at all Likely	# responses = 129/814 (15.8%)
2.	= 125/814 (15.4%)
3.	= 186/814 (22.9%)
4.	= 131/814 (16.1%)
5. Very Likely	= 236/814 (29.0%)
6. Job Probably wouldn't be replaced	= 1/814 (0.1%)
7. Don't Know/Not Sure.	= 6/814 (0.7%)

This question was answered by 814 establishments. In most cases, those who did not answer the question refused to provide information on a select individual. The percentages in parentheses indicate the distribution of responses.

The question provides data on the marginal probability, $\Pr(\text{Hire in } j)$. The survey did not ask a question about the conditional probability $\Pr(\text{OHire in } j \mid \text{Hire in } j)$. As noted above, by saying that a younger worker would be preferred to an otherwise equivalent older worker, an employer could open up a hornet's nest of legal liability. Since honest reporting was unlikely for the conditional question, we decided not to ask it. Thus, this paper focuses on the marginal probability; the survey provides high quality information on that.

Table 1 presents an overview of the data. Column 1 presents averages within the sample of establishments where the answer to Q1 was 4 or 5, and column 3 presents a similar average within the sample of establishments where the answer to Q1 was 1 or 2. The standard deviations of these averages are in columns 2 and 4. Thus, the first entry in column 1 indicates that for those

establishments where the selected worker's job would likely be filled with a new hire, 28 percent of the selected workers were managers. The corresponding number in column 3 is 44 percent, and, as indicated by the asterisk, this difference between columns 1 and 3 is statistically significant at a .01 level. Of course, this result is no surprise; firms often prefer to select managers from the ranks of existing employees. Although managers are sometimes hired from the outside, that is rather unusual. Note that the phenomenon does not arise in the second row. Jobs held by professionals (accountants, engineers, lawyers) are relatively *more* likely to be filled from the outside.

Block B of Table 1 presents data on the demographic characteristics of the selected worker. While health and gender are not significantly different in column 1 and column 3, there are differences in age, tenure in the establishment and education. As one would expect, the average tenure is shorter for selected workers in jobs that are filled from the outside. In contrast, the average education is larger for these workers. This education result is consistent with the above result on professionals: highly educated professionals are often in jobs that are filled from the outside.

Block C of Table 1 presents information on salient characteristics of the selected worker's job. There are clear differences in compensation. Selected workers in jobs that are filled from the outside tend to be paid less and are less likely to have a defined benefit pension. Although not shown in this table, the pensions in jobs filled from the outside tend to be defined contribution pensions. Note also that average weekly hours are roughly the same in column 1 and 3; the difference in compensation is evidently not simply a consequence of people working longer hours.¹⁶ Although the next two variables in block C – union status and training – have

similar means in column 1 and 3, the final variable in block C indicates differences in something like specific training. Respondents were asked,

- How transferable are the skills involved in doing [NAME]’s job to other organizations – would you say not at all transferable, somewhat transferable, or very transferable?

For jobs that were filled from the outside, skills were perceived to be significantly more transferable.

Block D of Table 1 presents data on filling the selected worker’s job with an outside hire.

The survey posed the following questions, which correspond to variables 16 – 19 in Table 1.

- About how long do you think it would take someone hired from outside your establishment to master the skills and gain the knowledge necessary to be fully comfortable performing [NAME]’s current job duties?
- If [NAME] were to leave her/his position and the job was filled with a new hire, what would be the ideal level of education for this new hire?
 1. High School Graduate or Ged
 2. Technical Diploma or Degree
 3. College Degree
 4. Graduate Work or Degree
- If [NAME] were to leave her/his position and the job was filled with a new hire, what would be the ideal number of years of experience for this new hire?
- If [NAME] were to leave her/his position and the job was filled with a new hire, we’d like to know how desirable it would be to fill the job with a recent graduate. On a scale from 1 to 5, where 1 means not at all desirable and 5 means very desirable, how likely is it that [NAME]’s job would be filled with a recent graduate?

Survey respondents indicate that jobs that are filled from the outside take somewhat less time to learn (variable 16) than those that are filled from the inside. Table 1 indicates that for jobs that are filled from the inside, employers do not seek a significantly higher level of education (variable 17). They do, however, want a higher level of experience (variable 18) in such jobs. Consistent with this, employers are much less likely to fill such jobs with a new graduate (variable 19).

This result on “experience” is both unexpected and paradoxical. In searching for a new job, older workers have one clear advantage over younger workers: they have more experience. The Table 1 result on “experience” suggests that an older worker’s experience is, in fact, of limited benefit; when an employer wants to put an experienced worker in a job, the employer prefers to not hire a new outside worker. Rather, the employer tends to fill the job from the inside. Such employers may, instead, go outside to hire workers into different entry jobs at the bottom of a job ladder, and concentrate hiring on young workers. This result is explored further in the subsequent multivariate work.

The final block of rows in Table 1 (Block E) presents information on the characteristics of the selected individual’s establishment. With regard to organization size, in those cases where an establishment does not belong to a larger organization, organization size equals establishment size. As expected, smaller establishments and smaller organizations are more likely to fill jobs from the outside. Note also the industry results: establishments in manufacturing, public administration, and transport, communications, and utilities tend to fill jobs from the inside; establishments in “other” services (services other than health, education, and social services) tend to fill from the outside.

The results in Table 1 strongly suggest that an employer’s propensity to fill a job with an outside hire not only varies between establishments but also between jobs in establishments. These cross-tabulations indicate that some jobs – particularly those with more generous compensation – are more likely to be filled from the inside. There remains the issue of whether such results remain valid in multivariate models.

IV. Multivariate Results

Table 2 presents ordered probit models of the employer's response to Q1. For this ordered probit the dependent variable ranges from a low value of one to a high value of five, and estimation involves selecting parameters $\alpha_1, \alpha_2, \dots, \alpha_4$ (referred to as "cut points") and β in a model of the form,

$$\begin{aligned} P_1 &= \Phi(\alpha_1 + \beta'x) \\ P_2 &= \Phi(\alpha_2 + \beta'x) - \Phi(\alpha_1 + \beta'x) \\ P_3 &= \Phi(\alpha_3 + \beta'x) - \Phi(\alpha_2 + \beta'x) \\ P_4 &= \Phi(\alpha_4 + \beta'x) - \Phi(\alpha_3 + \beta'x) \\ P_5 &= 1 - \Phi(\alpha_4 + \beta'x) \end{aligned}$$

where P_1, P_2, \dots, P_5 are the probabilities corresponding to the five values of the dependent variable, $\Phi(\cdot)$ is the cumulative standard normal distribution function, and x is a vector of explanatory variables. Models were estimated after deleting observations with missing data from the sample.

The first model in Table 2 includes variables indicating the selected worker's occupation and level of education. These variables essentially act as controls for the nature of the job, and are thus included in the subsequent models. The negative coefficient on the manager occupation variable indicates that managerial jobs tend to not be filled from the outside. Note, however, from the associated t-statistic the coefficient is not statistically significant at conventional levels. Indeed, the only statistically significant coefficient in this first model is the positive coefficient on years of education. Thus, as the education requirements of a job increase, the job is more likely to be filled from the outside.

Model 2 introduces three proxies for specific training: the number of months for a newly hired worker to learn the job, whether the person who currently fills the job has skills that are easily transferred to other organizations, and whether the job rarely involves employer sponsored

training. From the first hypothesis, we expect outside hires to be more likely in jobs that require few months to learn, that involve skills that are easily transferred to other organizations, and that rarely involve employer sponsored training. At least for the first two variables, the results in model 2 are consistent with that. Interestingly, however, the coefficient on employer sponsored training has an unexpected sign and is not statistically significant. Of course, that may simply reveal that the other two variables are better proxies for specific training.¹⁷

Model 3 in Table 2 introduces three proxies for delayed payment contracts: the selected worker's wage and tenure with the firm, as well as a variable indicating that the worker has a defined benefit pension. From the second hypothesis, jobs with delayed payment contracts are expected to be filled from the inside. As such, the three proxies are expected to have negative coefficients. The results in model 3 fully accord with that hypothesis.

As noted above, the three proxies for delayed payment contracts may not necessarily reveal the delayed payment contracts described in Lazear (1979, 1981). They could conceivably be associated with specific training or other forms of fixed cost. Note, however, that the coefficients on the measures of specific training in the model are largely unaffected by inclusion of these proxies.

The fourth model introduces the employer's assessment of the ideal education and experience of a new hire for the job currently occupied by the selected worker. Note that when these variables are entered, the actual education of the selected worker is dropped from the model. Note also that the number of observations falls with this model. This is because several respondents answered "don't know" to the question about ideal education.

As was the case in Table 1, the ideal experience variable is negatively and significantly related to the employer's propensity to fill the job with a new outside worker. There is then

evidence here that an older worker's experience is of limited value when looking for a new job. When employers want an experienced worker, they tend to fill the job from the inside.

One can only speculate about the economic forces that underlie this unexpected result. A possible explanation focuses on asymmetric information. Perhaps when respondents say that several years of experience would be ideal, what they are really saying is that the ideal person for this job should have qualities that are only revealed with time, e.g., leadership skills, the ability to "get things done," or integrity. It is interesting that the word "experience" is often used this way in the world of national politics. An "experienced" politician has survived a series of challenging tests, and thereby revealed qualities that are valued in a leader. Perhaps the same is true within the firm.

If "experience" really means qualities that are only revealed with time, then an outsider may be at a disadvantage relative to an insider. The firm arguably has better information on such hard to observe qualities for insiders. Indeed, it may use rank order tournaments to obtain information on such traits. By this interpretation, the result on "ideal experience" in model 4 reveals a paradox. Those jobs for which older workers *should* have a comparative advantage – jobs where years of experience are of value – are paradoxically jobs for which firms do not hire outside older workers. Although there are undoubtedly outside older workers who can perform well in the jobs, firms tend to fill such jobs with *inside* older workers.

Model 5 introduces measures of establishment size and organization size. Consistent with the third hypothesis, larger establishments and organizations are more likely to fill the job from the inside, *ceteris paribus*. (For most of the establishments and organizations in the sample, the quadratic is decreasing. It reaches a minimum at an establishment size of 16,364, and an organization size of 96,377.) Only the result for organization size is, however, statistically

significant at conventional levels. Note that the other variables in the model – the proxies for specific training and for delayed compensation – do not change dramatically when firm size variables are included. This is consistent with the argument associated with the third hypothesis, i.e., these measures of establishment and organizational size are not simply proxies for specific training or delayed payment contracts. Asymmetric information may also play a role here. Larger firms may be less likely to fill jobs from the outside because they know there is an insider who has better productivity characteristics than the average outsider.

Finally, Model 6 introduces a vector of industry and region dummies. The results reinforce the conclusion that there is evidence in support of the three initial hypotheses. Jobs that are embedded in large organizations, that involve specific training, and that have characteristics of delayed payment contracts tend to be filled from the inside. Inclusion of the industry and region dummies has little effect on the estimated coefficients.

V. Conclusion

Older workers bring many positive attributes to the job. Not only do they have a reputation for excellent work habits (AARP, 2000), but they can also draw on a lifetime of experiences. As such, it is interesting that older workers have difficulty finding new jobs. In particular, employers appear to not hire older workers for jobs that are currently held by older workers – jobs that older workers can obviously do.

Of course, some of this could be due to prejudice and age discrimination. The point of the economic literature on this topic is that other forces may also be at work. Barriers to hiring older workers could not only be due to age discrimination, but also due to economic phenomena associated with the activities of the firm.

This paper argues that one reason why older people are not hired for jobs currently held by older workers is that these jobs are often filled from the inside. The employer simply does not fill the job with a new worker – either young or old. The empirical evidence indicates that jobs currently held by older workers are more likely to be filled from the inside when (a) they involve fixed costs associated with specific training, (b) they involve delayed payment contracts, (c) they require a more experienced worker, and (d) the job is embedded in a large organization.

Although the previous literature on why older workers are employed but not hired for some jobs has been largely based on a theory of fixed costs, this paper suggests that other explanations need to be considered. In particular, asymmetric information on the characteristics of inside versus outside workers may provide a useful theoretical basis for predicting when jobs will be filled from the inside.

The empirical result on “ideal experience” may be particularly revealing. One would think that older workers would have a comparative advantage in jobs that require several years of experience. Yet, this paper finds that such jobs are precisely the kinds of jobs that employers tend to fill from the inside. Thus, while there may well be outside older workers who are qualified to do such jobs, they do not have an opportunity to compete for the job. The employer prefers to fill such jobs with insiders.

From a governmental policy perspective, this result provides support for policies that encourage retention of older workers. The governments of both the United States and Japan are trying to increase labor force participation of older people. One way to do this is through reduced hiring barriers and creation of greater job opportunities for older workers. Another way to proceed is to encourage retention of older workers in their career jobs. There are advantages to emphasizing retention. If at age 50 a specific job was the highest and best use of a worker’s

labor, then that is likely to still be true at age 63 or 65. Moreover, as indicated in this study, an employee's "experience" may primarily be of value to the current employer. While other employers have jobs for which experience is important, they do not hire outside older workers for those jobs.

In this regard, aspects of Japan's 2004 legislation on employment of older persons may provide a useful model to other countries.¹⁸ The legislation contains several provisions that encourage employers to maintain the employment of current older workers. Moreover, in the event that an older worker is laid off for economic reasons, the employer must assist that person in finding new employment by providing documents about the professional experiences and skills of the older person. Thus, the legislation not only emphasizes retention, but also helps improve market information on workers who are not retained. Such policies thereby increase the likelihood that an experienced older person will work for an employer who values that experience.

Table 1
Descriptive Statistics on Jobs by Whether Job Is Filled With An Outside Hire

	Employer Response to Question about Whether Job is Likely to be Filled with a New Outside Hire (Q1):				Fraction Missing in Sample (5)
	"Yes" (Q1 = 4,5)		"No" (Q1 = 1,2)		
	Stand		Stand		
	<u>Mean^a</u> (1)	<u>Error</u> (2)	<u>Mean^a</u> (3)	<u>Error</u> (4)	
A. Occupation of the Selected Worker's Job					
1. Manager	0.28 *	0.02	0.44	0.03	0.00
2. Professional	0.48 *	0.03	0.31	0.03	0.00
3. Sales	0.06	0.01	0.04	0.01	0.00
4. Clerical	0.18	0.02	0.21	0.03	0.00
B. Demographic Characteristics of Selected Worker (SW)					
5. Age	58.43 *	0.19	58.90	0.27	0.00
6. Education (years)	15.09 *	0.10	14.69	0.13	0.02
7. Health (0 = worst possible, 10 = best possible)	7.61	0.10	7.79	0.11	0.04
8. Gender (male = 1, female = 0)	0.48	0.03	0.50	0.03	0.00
9. Job tenure in establishment (years)	13.24 *	0.47	16.63	0.59	0.01
C. Characteristics of Selected Worker's Job					
10. Regular annual salary before taxes (in thousands of \$)	53.81 *	2.23	69.72	5.40	0.09
11. Number of hours worked by SW in a typical week	42.56	0.43	43.00	0.47	0.01
12. Covered by a Defined Benefit Pension	0.34 *	0.03	0.47	0.03	0.02
13. Is SW's job covered by union contract? (1=yes;0=no)	0.13	0.02	0.15	0.02	0.00
14. There is rarely employer sponsored training in SW's job 1=yes (rarely); 0=no	0.20	0.02	0.22	0.03	0.01
15. Are SW's skills transferable to other organizations? 1 = not at all; 3 = very	2.48 *	0.03	2.34	0.04	0.01
D. What if the job is filled with an outside hire?					
16. How many months for new hire to learn SW's job?	11.93 *	0.89	14.33	1.08	0.03
17. Ideal education for the new hire. 1=high school grad; 4=Graduate work or degree	2.86	0.05	2.91	0.06	0.06
18. Ideal amount of experience for the new hire (years)	5.04 *	0.18	5.99	0.25	0.02
19. How desirable to fill job with a recent graduate? 1 = not at all desirable; 5 = very desirable.	2.44 *	0.06	1.78	0.07	0.01

a. Column 1 indicates the fraction of those establishments that responded "yes" to Q1 that had the row characteristics, and column 3 indicates the fraction of those establishments that responded "no" to Q1 that had the row characteristics. Thus, the occupation categories sum to 1 in both column 1 and 3.

* The difference between the means in columns 1 and 3 is statistically significant at a .05 level.

Table 1 (Continued)
Descriptive Statistics on Jobs by Whether Job Is Filled With An Outside Hire

	Employer Response to Question about Whether Job is Likely to be Filled with a New Outside Hire (Q1):				Fraction Missing in Sample (5)
	"Yes" (Q1 = 4,5)		"No" (Q1 = 1,2)		
	Stand		Stand		
	<u>Mean</u> ^a	<u>Error</u>	<u>Mean</u> ^a	<u>Error</u>	
	(1)	(2)	(3)	(4)	
E. Characteristics of the Establishment					
20. Size of Establishment	225 *	25	336	62	0.00
21. Size of Organization	3865 *	882	6657	1373	0.05
22. Establishment is Part of a Larger Organization	0.34 *	0.02	0.44	0.03	0.00
Industry of Establishment					
23. Construction	0.02	0.01	0.02	0.01	0.00
24. Manufacturing	0.15 *	0.02	0.23	0.03	0.00
25. Transportation, Communications and Utilities	0.04 *	0.01	0.06	0.02	0.00
26. Wholesale and Retail Trade	0.11	0.02	0.09	0.02	0.00
27. Finance	0.05	0.01	0.05	0.01	0.00
28. Health, Education, and Social Services	0.14	0.02	0.15	0.02	0.00
29. Other Services	0.42 *	0.03	0.28	0.03	0.00
30. Public Administration	0.07 *	0.01	0.13	0.02	0.00
Region of Establishment					
31. East	0.18	0.02	0.15	0.02	0.00
32. Central	0.30	0.02	0.28	0.03	0.00
33. South	0.33	0.02	0.31	0.03	0.00
34. West	0.19 *	0.02	0.26	0.03	0.00

a. Column 1 indicates the fraction of those establishments that responded "yes" to Q1 that had the row characteristics, and column 3 indicates the fraction of those establishments that responded "no" to Q1 that had the row characteristics. Thus, the occupation categories sum to 1 in both column 1 and 3.

* The difference between the means in columns 1 and 3 is statistically significant at a .05 level.

Table 2

Employer Response to Question About Whether Job Is Likely To Be Filled with an Outside Hire (Q1)
Models Estimated with Ordered Probit; Dependent Variable Ranges from 1 (Not Likely) to 5 (Very Likely)

Variable Name	<u>Model 1</u>		<u>Model 2</u>		<u>Model 3</u>	
	Coeff.	t	Coeff.	t	Coeff.	t
Occupation^a and Education of the Selected Worker (SW)						
Occupation is Manager	-0.3131	(1.5)	-0.3660	(1.8)	-0.2172	(1.0)
Occupation is Professional	0.0033	(0.0)	-0.0250	(0.1)	0.1410	(0.7)
Occupation is Clerical	-0.0686	(0.3)	-0.1682	(0.8)	-0.0606	(0.3)
Education (years)	0.0608	(2.7)	0.0616	(2.7)	0.0720	(3.1)
Proxies for Specific Training						
There is rarely employer sponsored training in SW's job			-0.0312	(0.3)	-0.0470	(0.5)
Number of months for a new hire to learn SW's job			-0.0095	(3.1)	-0.0066	(2.1)
SW's Skills are Very Transferable to other Organizations			0.1510	(2.3)	0.1470	(2.2)
Proxies for Delayed Payment Contracts						
SW Covered by a Defined Benefit Pension					-0.2133	(2.5)
SW's Job tenure in establishment (years)					-0.0144	(3.1)
SW's Salary (in thousands of \$)					-0.0017	(2.7)
Ideal Experience and Education of a New Hire						
Ideal Experience (years)						
Ideal Education (1 = high school; 4 = graduate school)						
Establishment and Organization Size (Number Employees)						
Organization Size						
Organization Size Squared						
Establishment Size						
Establishment Size Squared						
Industry and Region Dummies Included						
	No		No		No	
Cutpoints						
Cut 1	-0.8664		-0.6768		-0.8794	
Cut 2	-0.3251		-0.1225		-0.3064	
Cut 3	0.2736		0.4832		0.3148	
Cut 4	0.7168		0.9275		0.7656	
Log Likelihood	-1084.40		-1076.90		-1063.18	
Pseudo R Square	0.01		0.02		0.03	
N	695		695		695	

a. The missing occupation is sales.

Table 2 (Continued)

Employer Response to Question About Whether Job Is Likely To Be Filled with an Outside Hire (Q1)
Models Estimated with Ordered Probit; Dependent Variable Ranges from 1 (Not Likely) to 5 (Very Likely)

Variable Name	<u>Model 4</u>		<u>Model 5</u>		<u>Model 6</u>	
	Coeff.	t	Coeff.	t	Coeff.	t
Occupation^a and Education of the Selected Worker (SW)						
Occupation is Manager	-0.0589	(0.3)	-0.0644	(0.3)	-0.1746	(0.8)
Occupation is Professional	0.2991	(1.4)	0.2859	(1.3)	0.1813	(0.8)
Occupation is Clerical	-0.1054	(0.5)	-0.0873	(0.4)	-0.1745	(0.7)
Education (years)	--	--	--	--	--	--
Proxies for Specific Training						
There is rarely employer sponsored training in SW's job	-0.0546	(0.5)	-0.0704	(0.7)	-0.0472	(0.4)
Number of months for a new hire to learn SW's job	-0.0050	(1.6)	-0.0045	(1.4)	-0.0051	(1.6)
SW's Skills are Very Transferable to other Organizations	0.1653	(2.4)	0.1729	(2.5)	0.1694	(2.4)
Proxies for Delayed Payment Contracts						
SW Covered by a Defined Benefit Pension	-0.2093	(2.3)	-0.1730	(1.9)	-0.1999	(2.1)
SW's Job tenure in establishment (years)	-0.0170	(3.5)	-0.0156	(3.2)	-0.0158	(3.2)
SW's Salary (in thousands of \$)	-0.0013	(2.0)	-0.0013	(2.0)	-0.0012	(1.8)
Ideal Experience and Education of a New Hire						
Ideal Experience (years)	-0.0315	(2.4)	-0.0320	(2.4)	-0.0304	(2.2)
Ideal Education (1 = high school; 4 = graduate school)	0.0748	(1.3)	0.0792	(1.4)	0.0838	(1.4)
Establishment and Organization Size						
Organization Size (Thousands of Employees)			-0.0168	(2.9)	-0.0163	(2.8)
Organization Size Squared			0.0001	(2.3)	0.0001	(2.2)
Establishment Size (Thousands of Employees)			-0.0637	(0.8)	-0.0658	(0.9)
Establishment Size Squared			0.0020	(0.8)	0.0021	(0.8)
Industry and Region Dummies Included						
	No		No		Yes	
Cutpoints						
Cut 1	-1.0299		-1.0510		-0.8561	
Cut 2	-0.4397		-0.4563		-0.2570	
Cut 3	0.1723		0.1606		0.3677	
Cut 4	0.6167		0.6105		0.8231	
Log Likelihood	-984.40		-978.87		-973.66	
Pseudo R Square	0.03		0.04		0.04	
N	644		644		644	

a. The missing occupation is sales.

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¹ Hirsch, MacPherson, Hardy (2000), p. 402.

² Computed from U.S. Census Bureau, Population Division, Population Projections Branch, National Population Projections, (2002), Table NP-T3. <<http://www.census.gov/population/www/projections/natdet-D2.html>>

³ For example, Committee for Economic Development (1999). For a particularly insightful discussion see Burtless and Quinn (2001).

⁴ OECD, Aging and Employment Policies, Japan (2004).

⁵ Hong Kong is attractive for this purpose because it does not have the kinds of anti-discrimination legislation invoked by Scott, Berger, and Garen (1995), who argue that such rules cause pensions to be associated with reduced hiring of older workers. Evidence in their 1996 paper is consistent with that. Among other things, Heywood, Ho, and Wei (1999) essentially argue that even without such rules, pensions are associated with reduced hiring of older workers.

⁶ See Baker, Gibbs, Holmstrom (1994), Table II; Lazear and Oyer (2004), Table 1.

⁷ This could simply be a consequence of age, e.g., the society may have a tradition of honoring and following the lead of older people. Thus, even though young and old are otherwise identical, the old are better managers; an identical young person can not lead as effectively.

⁸ More rigorously, let the firm choose between two strategies: (1) in every period hire one outside old worker into the M-job, as well as $N/2$ young workers into the R-job under a two period contract every period; (2) in every period promote one inside worker (who in the previous period was a young worker in the R-job) into the M-job, and hire $N/2+1$ young workers into the R-job. Under the first strategy, the expenditure per period on fixed costs is $NF_R/2+F_M$. Under the second strategy, this cost is $NF_R/2+F_R+F_M$. The first strategy is less costly than the second.

⁹ That handful includes Demougins and Siow (1994), Novos (1995), and Waldman (2003). Tournament theory provides another explanation for why jobs are filled internally, rather than with outside hires. Once again, however, the theory does not provide much guidance on what types of jobs will be filled from the outside. The literature on promotion tournaments is large and growing (Prendergast (1999) provides a useful review). Here the firm faces a different kind of information problem: it can observe an *ordinal* ranking of employees from best to worst rather than a *cardinal* measure of each employee's performance. In order to induce optimal effort, the firm fashions a tournament whereby the best performer is promoted to a higher paying job. From the perspective of this paper, tournament theory provides an explanation for why some jobs are often filled internally: some jobs are prizes in the tournament. To fill them from the outside is to reduce the incentives of the tournament (Chan, 1996; Chen, 2005). Other jobs may be primarily filled from the inside because the firm has a long-term implicit contract with its workers, and therefore provides jobs to losers in the tournament. Unfortunately, the theory gives little guidance about the characteristics of jobs that are prizes, jobs that go to losers, and how and why such jobs differ from jobs that are filled from the outside.

¹⁰ Intuitively, a worker with a very low propensity to shirk or steal can be induced to forgo shirking and malfeasance with minimal delayed compensation. And less delayed compensation implies a lower fixed cost of the form analyzed in Hutchens (1986).

¹¹ These arguments are similar to those in Aoki (1989, 1990). Aoki's J-firm not only uses delayed compensation, but also uses screening mechanisms to weed out low productivity workers. Implicit in Aoki's discussion is the idea that, at least for some components of productivity, the firm has better information on insiders than outsiders.

¹² The data pertain to jobs currently held by older workers. Under a delayed payment contract, older workers should receive relative high wages in such jobs, *ceteris paribus*. Under a delayed payment contract a defined benefit pension is more likely than a defined contribution pension because it is easier to fashion a defined benefit pension so that a worker who is dismissed due to shirking or malfeasance, suffers a loss in future pension benefits.

¹³ Due to these restrictions on the sample, results cannot be compared to a benchmark survey. There exists no other comparable national survey of establishments that includes information on the demographics of the establishment's workforce. We have, however, compared the industry, region, and union characteristics of this sample with the Health and Retirement Survey sample of older white-collar workers in establishments with more than 20 employees. The results are remarkably similar.

¹⁴ Kalleberg, Marsden, and Aldrich (1990) provide a particularly useful introduction to these data, along with a discussion of their advantages and disadvantages.

¹⁵ Of course, if the respondent did not know of three older men (women) in the establishment, we accepted the other gender.

¹⁶ When the selected workers were chosen, the respondent was asked to focus on full-time workers. It should also be noted that a check on health insurance coverage between the column 1 and 3 jobs reveals no difference.

¹⁷ Alternatively, this variable may not adequately measure employer sponsored training. The relevant training may have occurred in previous jobs at the firm before the selected worker moved to his or her current job.

¹⁸ See Law Concerning Stabilization of Employment of Older Persons amended on June 11, 2004, for details http://www.jil.go.jp/english/laborinfo/library/documents/llj_law16.pdf.