

Internal and external hiring: the role of prior job assignments

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Abstract: Using a large, linked, employer-employee panel data set from Finland we highlight the importance of work history as a determinant of internal-versus-external hiring decisions. Prior studies have shown that external candidates need better observable indicators of ability (in terms of education and experience) than internal candidates do. Our work confirms those results. We also show the (new) result that external candidates need strong observable indicators of ability in terms of prior career success and occupation-specific human capital to be hired.

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Introduction

An important question organizations regularly face is whether to fill a job vacancy with an internal hire or an external recruit. Obviously employers know a lot about their internal candidates and far less about external ones. Empirical work on the subject has uncovered two basic facts suggesting that external candidates are riskier and are held to a higher standard: 1) Firms tend to favor insiders for promotions; 2) External hires typically have more education and experience than insiders.⁴ But when evaluating external applicants, employers have access to more information than just “education and experience”. Except for new entrants to the labor market, an applicant’s résumé contains a wealth of information about the prior job history that can serve as a valuable signal of applicant quality (e.g. Bills 1990) and that should influence the internal-versus-external hiring decision. Due to daunting data requirements, however, virtually nothing is known about how internal-versus-external hires differ in their work histories.

The main problem is that in most relevant datasets, a firm-to-firm transition is a data-destroying event. That is, when a worker leaves a firm we usually see little about where they go next, and if they enter a firm we usually see little about their previous employment spell. Most research that distinguishes between internal and external hires either uses data from a single firm, or concentrates on a specific job type, say, CEOs. Such studies suffer from the aforementioned limitations. Additionally, the extent to which the results from single-firm studies generalize is unclear.

In this study we use a large, linked, employer-employee panel data set from Finland to address empirical questions concerning internal-versus-external hiring. In addition to providing new evidence on the two basic facts identified in the prior literature, we tackle new questions (particularly those concerning the job histories of internal and external hires) that could not have been addressed using other data sets. The data set allows us to determine job histories from rich information on prior job assignments and other career outcomes. Another strength of the data set

⁴ Empirical evidence on differences in education and experience between internal and external hires can be found in Baker et al. (1994), Bidwell (2011), Kauhanen and Napari (2012). Theoretical work on internal and external hiring includes Chan (1996), Waldman (2003), and DeVaro and Morita (2013).

is that it includes comparable job titles across firms, which allows us to define similar career movements within and across firms.⁵

We first document the relative frequencies of seven different ways to enter a job: 1) internal promotion, 2) internal lateral transfer, 3) external promotion, 4) external lateral transfer (same hierarchical level but different job title), 5) external hiring from the same job title, 6) internal demotion, and 7) external demotion. We find that the two most common types of entry to a job are from outside of the firm from the same job title, and by internal promotion. Internal horizontal transfers and internal demotions are also rather frequent, but external promotions, external horizontal transfers, and external demotions are rare.

We then conduct a multinomial logit analysis where the dependent variable depicts the seven ways to enter a job to address the following questions: 1) How do entrants' job histories, and other observable indicators of ability, vary according to the route by which they arrived at their current job?, and 2) How do the job's hierarchical position and employment growth affect how they are filled?

Our main results concern the differences between internally promoted workers and those hired externally from the same job title. The typical job histories of these two types of entrants are different: External hires from the same job title have more prior employers but fewer prior job titles than internally promoted employees. As a consequence, the two types of entrants are likely to possess different kinds of human capital. External hires from the same job title typically have significant experience in that title, which can be expected to generate considerable job-specific human capital. Internally promoted employees, on the other hand, have experience from more jobs, and they have firm-specific capital that external hires lack. The external hires also have had more promotions and fewer demotions before entering the job.

These results suggest that external candidates need strong observable indicators of ability (in terms of prior career success and occupation-specific human capital) to be hired. In addition to strong job history, the external hires are also more educated and experienced.

⁵ See Kauhanen and Napari (2012) for more details.

Turning to the job level characteristics, the results show that internal hiring is more common at higher organizational levels, and external hiring is very rare unless employment in the job is growing strongly.

Our work builds on prior studies that have shown how internal and external hires differ in education and experience (Baker et al. 1994, Bidwell 2011, Kauhanen and Napari 2012) and on the theoretical literature on internal and external hiring (Chan 1996, Waldman 2003, DeVaro and Morita 2013). Our study complements recent work that explores the signaling role of prior work history and the idea that employers draw inferences about the ability of prospective hires by observing their histories of “job hopping”. Fan and DeVaro (2014) find empirical evidence for a “job hopping wage penalty” for college graduates but not high school graduates, interpreting that evidence as supportive of asymmetric employer learning (about worker ability) for college graduates and symmetric learning for high school graduates. However, that study uses NLSY data and has no information on job hierarchy, which is our focus. It considers only the wage as a dependent variable, whereas we focus on internal-versus-external hiring and how these transitions occur across levels of a job hierarchy.

Prior literature

An empirical literature on employee mobility shows that a significant share of jobs is filled by internal instead of external recruiting (e.g. Baker et al. 1994, Lazear and Oyer 2004b). Three theoretical explanations have been offered for firms’ tendency to favor internal promotion. One reason is asymmetric information. If firms are better informed about internal candidates than about external candidates (e.g. Novos 1992, Novos 1995), they may favor internal candidates over external ones with similar observable characteristics.⁶ For example, whereas an external applicant with a low education level would be screened out, a low-educated internal candidate who is observed to be of high ability may be favorably treated. In fact, external recruits have been found to be more educated and experienced than internal hires (Baker et al. 1994, Bidwell 2011, Kauhanen and Napari 2012).

Under asymmetric learning, the observable indicators of ability that employers use in hiring decisions include not only education and experience, but also prior work history. The role of prior work history has been explored but in a limited way. Most of the work on the signaling role of

⁶ See Kahn (2013) for recent empirical evidence of asymmetric learning about worker ability.

promotions (e.g. Waldman 1984, MacLeod and Malcomson 1988, Ricart i Costa 1988, Waldman 1990, Owan 2004, DeVaro and Waldman 2012) focuses on the signal implied by a worker's most recent job assignment.⁷ But the work history that can be gleaned from a résumé in virtually every job application is much richer. The signaling role of these more comprehensive work histories has been neglected, both theoretically and empirically. A recent exception is Fan and DeVaro (2014), which finds empirical evidence for a "job hopping wage penalty" for college graduates but not high school graduates, interpreting that evidence as supportive of asymmetric employer learning for college graduates and symmetric learning for high school graduates. While Fan and DeVaro looks at how mobility affects wages, we study how employees entering a job through different channels differ in their job histories. The Finnish data are unique in allowing us to observe detailed job histories for both internal and external applicants, which approximates the kind of information prospective employers have about candidates.

A second reason for an internal hiring preference is that incumbent workers have valuable firm-specific human capital that external workers lack (e.g. Bayo-Moriones and Ortín-Ángel 2006, DeVaro and Morita 2013). Prior empirical evidence that external hires are more educated and experienced may be a consequence of firm-specific capital: because external hires lack such human capital, they need to be even more educated and experienced to match the performance of internal candidates who possess firm-specific capital. What limits the appeal of this argument is that recent literature on human capital has moved beyond the classic general-versus-firm-specific dichotomy and has shown that much of human capital is actually occupation specific (Kambourov and Manovskii 2009) or task specific (Gathmann and Schonberg 2010) and thus transferable across firms⁸. Lazear (2009) argues that all skills are general, but that firms differ in their weighting of different skills, thus creating firm-specificity in skills.⁹ If human capital is mostly occupation or task-specific, then external candidates from within an occupation do not suffer a disadvantage based on human capital considerations. We can examine the role of occupation-specific human capital given that we observe the job histories of external recruits, which allows us to distinguish between

⁷ Bernhardt (1995) considers a three-period promotion signaling model in which two promotions are possible, but the work history is still limited to a single firm since no cross-firm promotions occur in equilibrium.

⁸ Some of the first papers to consider occupation-specific human capital were Shaw (1984), and Shaw (1987).

⁹ See also Morita and Noone (2014).

those who come from the same job and those who come from another job and/or hierarchical level.

The third explanation for favoring insiders concerns incentives (Malcomson 1984, Chan 1996). One purpose of promotions is to create incentives to exert effort, as in Lazear and Rosen (1981) and Ghosh and Waldman (2010), or to invest in human capital, as in Prendergast (1993), Zabojnik and Bernhardt (2001), and DeVaro et al. (2014). These incentives are reduced if the firm toughens its workers' competition by also hiring externally. Waldman (2003) suggests that established internal hiring policies are a way for firms to credibly commit to promoting workers internally even when there are better external candidates available. This resolves a time inconsistency problem created by the dual role of promotions, both in creating incentives for lower-level workers and for efficiently assigning workers to higher-level jobs. That is, a firm that relies on promotions to create incentives may tend to renege on an earlier promise to promote the top performer if it later becomes clear that there is a stronger (perhaps external) candidate for a managerial post. But such renegeing comes at the cost of undermining worker incentives. The result is that firms prefer to hire internally and only hire externally when the candidate is exceptionally good (which explains the wage premium enjoyed by external hires). These incentive considerations are only relevant when the number of employees in the promotion competition is fixed. If a job is expanding, external hiring is a natural way to fill the slots.

The management literature has also considered various firm and job characteristics that may explain why employers prefer internal over external hiring.¹⁰ Certain firm practices, such as measuring employees' skills and provision of training, are associated with internal hiring (Pfeffer and Cohen (1984), Wholey (1985), Bayo-Moriones and Ortín-Ángel (2006)). Bidwell and Briscoe (2010) find empirical evidence for inter-firm mobility occurring more often from larger to smaller firms, and into firms with a high proportion of workers in the focal occupation. We provide further empirical evidence on firm size and employment choice between various entrants.

¹⁰ Regarding job characteristics, internal hiring is more likely for jobs with a higher performance variability and a larger grade ratio of junior to senior workers (Lepak and Shaw (2008), Huselid and Becker (2011), Bidwell and Keller (2014)).

The EK data

We use a large, linked, employee-employer panel dataset from 1981 to 2006. The data come from the records of the Confederation of Finnish Industries (EK), which is the central organization of employer associations in Finland. Although EK has member firms from many industries, manufacturing has traditionally been the most important sector represented in the data. The firms affiliated with EK represent over two thirds of the Finnish GDP and over 90% of exports. The member firms account for approximately 33% of total employment in Finland, which covers a significant share of the Finnish economy.

EK collects the data by sending annual surveys to its member firms. One of the main purposes of the survey is to provide information for the central wage negotiations. The response rate is very high because all member firms, except for the smallest ones in a few particular industries, are required to respond to the survey. The data are based on the administrative records of the member firms, which guarantees that all information is accurate and of high quality.¹¹

The EK data are particularly well suited for our study given that they allow us to: observe workers' prior career histories; construct comparable job classifications across firms; identify many different types of career moves; measure workers' human capital; measure wages reliably; and construct prior career histories up to 25 years.¹² Importantly, the EK data include job titles that are used in every EK member firm. Therefore, we can classify jobs in comparable manner across firms, as described in more detail below. Crucially, the classification allows us to define the prior work history similarly for both internal and external hires. Internal and external hires can, in turn, be distinguished by firm identifiers. The human capital of the employees can be measured by their education and several variables describing their work experience, i.e., potential experience, firm tenure, the number of job titles, job levels, firms, promotions, and demotions to date, years at the current job title, and years at the current level).

¹¹ Similar data were collected in Sweden and have been used in Lazear and Oyer (2004a), among others.

¹² There might be gaps in the career e.g. due to spells of unemployment or spells of employment in other sectors.

Although the data contain information on both white-collar and blue-collar workers, we restrict the analysis to full-time, white-collar employees.¹³ This is mainly because the occupational classification system in the blue-collar data is not comparable across firms.

We focus on employees who enter a job from another job observed in the data, thus we exclude employees who enter jobs from outside the data. The data include 468,517 person-year observations that come from 231,565 unique individuals, who work in 4579 different firms. Thus, on average, each person appears roughly twice in the data.

Identifying career moves

The identification of career moves is based on job titles, job levels, and firm identifiers. We first describe the job title classification. We do this separately for the years 1981-2001 and 2002-2012, since the classification changes starting in 2002.

In the years 1981-2001 there are 75 different job titles that are used in all firms. Changes in job titles can thus be easily identified both within and across firms. To identify changes in hierarchical levels, e.g. promotions, the job titles need to be classified into a hierarchy. This can be done using the detailed description of the features of the jobs that are provided as part of the data gathering process. For example, there is information on the level of education and work experience typically required for the job in question, whether the job contains managerial duties and financial responsibilities, whether the operational environment is dynamic and complex or whether the job is instead comprised of more or less repetitive tasks.

We follow the hierarchical classification of Kauhanen and Napari (2012). They apply the descriptions of jobs to sort them into six hierarchical levels, assigning the job titles to levels as follows. The top of the hierarchy (Level 1) consists of managerial jobs associated with financial responsibility and administrative duties. Jobs that require a substantial expertise and in which the operational environment is complex are allocated to the second level. The third level also includes expertise jobs associated with varying operational environments, but in which the required level of prior experience is lower than in jobs at the second level. Jobs at the fourth level require a reasonable level of expertise acquired either through formal education or through work experience, but the problems to be solved are less complex than in jobs higher in the hierarchy.

¹³ An individual is working full time if his/her regular weekly working hours exceed 30. Part-time work for white-collar workers in manufacturing is rare (less than 2% in 2006).

The second-to-last level includes jobs for which some prior work experience is needed, but for which the tasks are repetitive in nature. The bottom of the hierarchy consists of routine jobs with low educational requirements involving repetitive and simple tasks.

In 2002 the job title classification becomes finer. The new classification contains 56 job titles and four hierarchical levels. We use the hierarchical classification in the data to identify changes in levels. Due to the change in the classification we cannot identify changes in job titles or hierarchical levels between 2001 and 2002. We discuss below how we handle this change.

Dependent variable

We identify seven ways to enter a job: 1) internal promotion, 2) internal lateral transfer, 3) external promotion, 4) external lateral transfer (same hierarchical level but different job title), 5) external hiring from the same job title, 6) internal demotion, 7) external demotion.¹⁴ The year 2002 is dropped from the analysis since we cannot identify changes in job titles and levels confidently for that year.

Promotions are defined as a transition from a lower hierarchical level to a higher position. This is consistent with the theoretical studies of careers and their definitions of promotions and does not have the problems associated with self-reported promotions (Pergamit and Veum 1999). Promotions are external (internal) if the firm identifier does (does not) change. Demotions are defined similarly.

Lateral transfers occur when the job title changes but the hierarchical level does not.¹⁵ External and internal transfers are again defined by change in the firm identifier. External hiring from the same job title is defined as a change in firm identifier while staying in the same job title and same hierarchical level.

The dependent variable is measured between year t and year $t+1$.

Predictors

We use the following variables in the analysis for which summary statistics are given in Table A1 in the appendix. The human capital of the employees is measured by years of education (and its square), potential experience (five categories), and firm tenure (five categories). Education and

¹⁴ An eighth way is to enter the data for the first time. We do not consider these workers, because we have no information on their prior career.

¹⁵ See Gittings (2012) for an analysis of lateral moves in a sample of American executives.

experience have been used in previous studies on external and internal hiring, but firm tenure has not. Firm tenure is measured at year t , so that it is measured similarly for firm changers and stayers.

Prior work history is measured by the number of job titles, job levels, firms, promotions, demotions to date; years at the current job title, and years at the current level. The variables depicting a number of career events are a running count of the events from the start of an employee's career to year t . For example, the number of job titles refers to all job titles the employee has held in her career to date. Years at the current job title and level are measured independently of employing firm.

We distinguish employees whose career we are able to follow from the start ("labor market entrants") and others. We follow Kauhanen and Napari (2015) and classify as a labour market entrant persons who are under 30 years old with less than 2 years of potential work experience when first observed in the data. For employees whose career started before 1981 or who have worked in firms that are not members of EK, we might miss some career events.¹⁶ All the prior work history variables are interacted with an indicator variable showing whether the person is a labor market entrant.

In addition to the individual-level variables, we consider job characteristics, distinguishing managerial and professional jobs (higher in the hierarchy) from expert and clerical jobs (lower in the hierarchy). We also construct three indicators distinguishing contracting, stable (omitted category), and growing jobs. Firm size is controlled by seven size classes. Other variables included in the analysis are industry dummies (53 categories) and year dummies.

All individual-level explanatory variables are measured in year t , and the job characteristics are measured in year $t+1$.

Methods

We estimate a multinomial logit model where the values of the dependent variable correspond to the seven ways ($j = 0, 1, \dots, 6$) to enter a job. Because the probabilities

¹⁶ We only observe the careers in EK member firms. This is not a serious limitation. Napari (2009) shows that transitions from the member firms of the EK to other private sector firms or to the public sector are rare. Additionally, Kauhanen and Napari (2015) report that movements between manufacturing and the services sector are rare (the incidence is approximately 0.1 percent per year).

$P(y = j | \mathbf{x}) = \frac{\exp(\mathbf{x}\boldsymbol{\beta}_j)}{1 + \sum_{h=1}^6 \exp(\mathbf{x}\boldsymbol{\beta}_h)}$ sum to unity, only 6 parameter vectors are estimated.

We set $\boldsymbol{\beta}_0 = \mathbf{0}$, taking internal promotions to be the base category. The log-odds ratio between

category j and the base category 0 is linear, e.g. $\log\left(\frac{P(y = j | \mathbf{x})}{P(y = 0 | \mathbf{x})}\right) = \mathbf{x}\boldsymbol{\beta}_j$ for $j = 1, 2, \dots, 6$, so $\boldsymbol{\beta}_j$

reveals how a change in \mathbf{x} affects the log-odds between category j and the base category.

Results

In the next three subsections we report three sets of results. First, we report the frequencies of the seven entry channels. Second, we describe how entrants in the seven categories differ in terms of human capital and work history, as well as how job and firm characteristics affect how a job is filled. Third, we show how the salaries of the entrants compare with each other, while controlling for the salary effects of human capital and work history.

Entry channels

Internal hires can be promotions, demotions, or lateral moves. The same three transitions exist for external hires, though in that case a fourth transition arises because lateral moves can be of two types (within the same job title, or across job titles). Table 1 displays the transition frequencies.

Table 1:

	All		Clerical & Expert		Managerial & Professional	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Internal promotion	121,787	25.99	35,418	14.06	86,369	39.87
External promotion	25,723	5.49	6,121	2.43	19,602	9.05
Internal horizontal transfer	85,724	18.3	55,738	22.13	29,986	13.84
External horizontal transfer	17,928	3.83	10,823	4.3	7,105	3.28
External hire from same job title	143,784	30.69	87,764	34.84	56,020	25.86
Internal demotion	57,414	12.25	44,141	17.52	13,273	6.13
External demotion	16,157	3.45	11,904	4.73	4,253	1.96
	468,517	100	251,909	100	216,608	100

Table 1 shows that the most frequent transition is an external lateral move from the same job title (30.7%). However, the other three types of external moves are least likely and collectively account for less than 13% of transitions. The second and third-most common transitions are internal promotions (26.0 %) and internal lateral moves (18.3%). In contrast to the evidence from the single firm investigated in Baker et al. (1994), internal demotions are not rare and account for 12.3% of transitions.

The importance of these entry channels differs across hierarchical levels. At the lower levels (Clerical & Expert), external recruiting from the same job title and internal horizontal transfer are the most common means of entry (34.8% and 22.1%, respectively). Internal demotions are even more common than internal promotions (17.5% vs. 14.1%). External demotions (4.7%), horizontal transfers (4.3%) and promotions (2.4%) are the least frequent transitions.

At the higher levels (Managerial & Professional), internal promotion is the most common transition (39.9%). External recruiting from the same job title is also frequent (25.9%). Internal horizontal transfers are less frequent (13.8%) for this group than across all jobs, but external promotions are more common (9.1%) than in all jobs on average. Internal demotions (6.1%), external horizontal transfers (3.3%) and external demotions (2.0%) are rare.

How do job entrants differ?

Table 2 shows the estimation results for the multinomial logit model, where the dependent variable is the entry type (between t and $t+1$), with internal promotion as the reference category.

External promotions

Externally promoted workers are more educated than internally promoted ones. Externally promoted workers are less experienced and their previous tenures are shorter than the tenures of internally promoted workers. They have also more prior employers than internally promoted employees. Other work history characteristics are not significantly different between employees promoted from inside and outside. Relative to internally promoted employees, externally promoted employees are more often men than women.

Internal horizontal transfers

Internally horizontally transferred employees are more experienced and have more prior job titles than internally promoted employees. They had the previous job title for a shorter period of time but they've been employed at the level longer than internally promoted employees were at their previous level. However, internally horizontally transferred employees have undergone more prior promotions and less prior demotions than internally promoted.

External horizontal transfers

There is no significant difference in the years of education between externally horizontally transferred and internally promoted employees. Externally horizontally transferred employees have a longer work experience but also a shorter tenure in the previous job. They have more prior job titles and prior employers than internally promoted employees. Externally horizontally

transferred employees had the previous job title for a shorter period of time than internally promoted employees. They have more prior promotions and fewer prior demotions. Men are relatively more likely to undergo external horizontal transfers than women, when compared to internal promotions.

External hires from the same job title

Employees who are hired from the same job title outside of the firm are more educated and more experienced than internally promoted employees. Their previous tenures are shorter, they have more prior employers and fewer prior job titles than internally promoted employees. External hires from the same job title have more prior promotions and fewer prior demotions than internally promoted employees. External hires from the same job title are also more likely to be men than women relative to internally promoted employees.

Internal demotions

Internally demoted workers are more educated and experienced than internally promoted ones. After 2 to 5 years of tenure, internal demotions are less likely than internal promotions, but beyond this the tenure length does not significantly change the likelihood of internal demotions as compared to promotions. Internally demoted employees have fewer prior job titles but more prior employers than internally promoted employees, and they have stayed a shorter time at the level. Internally demoted have also undergone more promotions and fewer demotions than internally promoted employees. Women are relatively less likely to be internally demoted than internally promoted.

External demotions

Externally demoted workers are more educated and more experienced than internally promoted ones. However, their previous tenures are shorter than the internally promoted employees' tenures so far. Externally demoted workers have more prior employers and they stayed shorter in the previous level than internally promoted employees. They have more prior promotions and fewer prior demotions as compared to internally promoted employees.

Table A2 shows the estimation results for the most stringent subsample, i.e., for those individuals whose career can be observed in every year from 1981 to 2002. The key results of the subsample on human capital and work history are similar to the results discussed above.

To sum up, human capital and work history characteristics play a significant role in determining how jobs are filled. Recruits from outside of the firm have, on average, higher observable indicators of human capital than internally promoted employees. This finding is familiar from the previous literature. The key new findings are that prior work history and job-specific human capital differ among various types of entrants.

How do job title and firm characteristics affect an entrant’s origin?

Job and firm characteristics determine where entrants originate. Relative to internal promotions, external promotions are made more often when the jobs are managerial and professional, as opposed to clerical and expert jobs. Recruits from the same level, either from inside or outside of the firm, as well as internal and external demotions are relatively less likely than internal promotions when filling managerial and professional jobs.

When the job title is stable (i.e. when the number of workers in that title remains relatively constant), and especially when it is contracting, external promotions, any kind of horizontal recruits and external demotions are relatively less likely than internal promotions. When the job is contracting, internal demotions are less likely relative to internal promotions.

The likelihood of external promotions, horizontal transfers, and demotions, relative to internal promotions, decreases with firm size, although the differences are not statistically significant for all firm size categories. Internal horizontal transfers happen relatively more often than internal promotions when the firm size is either 50-100 or more than 2000, whereas recruits from the same title outside of the firm occur relatively more often when the firm size is between 50-100 and 500-1000. Internal demotions are relatively less likely than internal promotions when the firm size is between 100-200, 200-500, or more than 2000.

The findings on the role of job and firm characteristics in the subsample of employees observed in all years from 1981 to 2002, reported in Table A2, are in line with the results obtained for the main sample.

Table 2 Multinomial logit analysis of routes to a job

External promotion	Internal horizontal transfer	External horizontal transfer	External hire from same job title	Internal demotion	External demotion
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Human capital:

Years of education	0.14*** (4.10)	-0.08* (-2.31)	0.05 (1.45)	0.14*** (4.65)	0.22*** (7.54)	0.40*** (11.02)
Years of education ²	-0.00*** (-3.46)	0.01*** (4.61)	0.00* (2.42)	-0.00 (-0.27)	0.00 (0.55)	-0.00* (-2.29)
Experience up to one year						
2-5 years	0.00 (0.03)	0.11** (3.23)	0.13*** (3.44)	0.20*** (5.80)	0.36*** (10.99)	0.38*** (9.47)
6-15 years	-0.06 (-1.49)	0.45*** (7.17)	0.29*** (6.21)	0.60*** (11.82)	0.87*** (18.54)	0.84*** (16.83)
16-25 years	-0.16** (-2.98)	0.70*** (8.75)	0.43*** (7.12)	1.01*** (15.67)	1.44*** (24.60)	1.22*** (19.63)
More than 25 years	-0.34*** (-4.85)	0.88*** (11.50)	0.39*** (5.38)	1.36*** (18.92)	2.01*** (31.69)	1.54*** (21.26)
Tenure up to one year						
2-5 years	-0.20*** (-5.01)	-0.06 (-1.03)	-0.15** (-3.15)	-0.06 (-1.11)	-0.15*** (-3.81)	-0.21*** (-5.07)
6-10 years	-0.40*** (-6.33)	0.00 (0.08)	-0.33*** (-5.02)	-0.13 (-1.77)	-0.05 (-1.21)	-0.43*** (-8.58)
11-15 years	-0.68*** (-10.49)	0.06 (0.96)	-0.47*** (-5.13)	-0.21** (-2.58)	0.05 (1.13)	-0.66*** (-9.91)
More than 15 years	-0.90*** (-12.45)	-0.01 (-0.09)	-0.69*** (-7.81)	-0.13 (-1.57)	0.04 (0.69)	-0.84*** (-12.14)
Female	-0.08** (-2.67)	0.00 (0.17)	-0.14*** (-4.61)	-0.41*** (-14.59)	-0.68*** (-28.77)	-0.82*** (-26.63)
Work history:						
Number of job titles to date	0.00 (0.08)	0.20*** (8.21)	0.17*** (5.11)	-0.07* (-2.39)	-0.06** (-2.96)	-0.04 (-0.96)
Number of employers to date	0.24*** (7.76)	0.00 (0.01)	0.28*** (7.83)	0.25*** (6.05)	0.07** (2.76)	0.35*** (11.04)
Years at title so far	0.00 (0.13)	-0.04*** (-8.41)	-0.04*** (-5.25)	0.01 (1.87)	-0.00 (-0.47)	0.02 (1.56)
Years at level so far	0.01 (1.36)	0.02*** (3.73)	0.02** (3.22)	0.01 (0.98)	-0.06*** (-8.82)	-0.06*** (-5.16)
Number of prior promotions	-0.08 (-1.59)	0.67*** (13.79)	0.64*** (13.74)	0.84*** (25.15)	1.65*** (47.74)	1.59*** (38.13)
Number of prior demotions	0.08 (1.24)	-1.01*** (-21.13)	-1.02*** (-25.32)	-0.90*** (-20.44)	-1.52*** (-32.03)	-1.57*** (-27.41)
Labor market entrant X Number of job titles to date	0.05 (1.66)	-0.00 (-0.09)	0.01 (0.19)	0.02 (0.87)	0.01 (0.33)	0.04 (1.06)
Labor market entrant X Number of employers to date	-0.00 (-0.11)	0.03 (1.47)	0.01 (0.41)	-0.02 (-0.75)	0.04 (1.80)	-0.00 (-0.16)
Labor market entrant X Years at title so far	0.01 (1.30)	0.01 (1.43)	0.02* (2.02)	-0.00 (-0.33)	0.00 (0.18)	0.01 (0.65)

Labor market entrant X Years at level so far	-0.01 (-1.29)	-0.02** (-2.97)	-0.02* (-1.98)	-0.01 (-0.84)	-0.01 (-0.70)	-0.01 (-0.50)
Labor market entrant X Number of prior promotions	-0.12 (-1.89)	-0.14*** (-4.16)	-0.16*** (-3.57)	-0.14*** (-4.02)	-0.26*** (-6.51)	-0.25*** (-5.15)
Labor market entrant X Number of prior demotions	-0.11 (-1.88)	0.17*** (4.61)	0.14** (2.63)	0.16*** (4.16)	0.24*** (5.03)	0.17** (2.64)
Job characteristics:						
Managerial and professional jobs	0.22*** (3.80)	-1.98*** (-52.76)	-1.87*** (-36.49)	-2.09*** (-41.81)	-3.36*** (-71.60)	-3.51*** (-70.10)
Expanding job						
Stable job	-0.45*** (-11.55)	-0.26*** (-9.44)	-0.49*** (-9.21)	-1.57*** (-26.09)	0.01 (0.34)	-0.47*** (-11.49)
Contracting job	-0.67*** (-6.09)	-0.39*** (-6.72)	-0.77*** (-5.12)	-1.63*** (-12.20)	-0.10* (-2.11)	-0.69*** (-9.86)
Firm size smaller than 50						
50-100	0.12* (2.14)	0.10* (2.42)	0.16** (2.64)	0.47*** (6.04)	-0.01 (-0.18)	0.20*** (3.35)
101-200	0.05 (0.75)	0.02 (0.50)	0.17* (2.42)	0.51*** (5.89)	-0.12* (-2.35)	0.18** (2.86)
201-500	-0.14* (-2.27)	0.05 (1.05)	0.03 (0.38)	0.42*** (4.20)	-0.18*** (-3.46)	0.04 (0.64)
501-100	-0.28** (-3.16)	0.12 (1.71)	-0.01 (-0.10)	0.56*** (3.84)	-0.11 (-1.78)	0.03 (0.34)
1001-2000	-0.49*** (-4.15)	0.08 (1.02)	-0.43*** (-3.95)	0.01 (0.04)	-0.12 (-1.82)	-0.30** (-2.72)
larger than 2000	-0.60*** (-3.81)	0.30*** (3.55)	-0.45* (-2.48)	0.10 (0.50)	-0.49*** (-5.39)	-0.52*** (-3.79)
Industry indicators	Yes	Yes	Yes	Yes	Yes	Yes
Year indicators	Yes	Yes	Yes	Yes	Yes	Yes

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Notes: t statistics are reported in parentheses (* p<0.05, ** p<0.01, *** p<0.001). The dependent variable is measured at year t+1, the human capital and work history variables are measured at t, and the job characteristics are t+1.

Conclusion

Using a large linked employer-employee panel dataset, we characterize the internal and external routes through which individuals enter jobs, and show that job entrants' job histories – perhaps the most important signal recruiters have about external job candidates' characteristics – vary considerably according to the routes the entrants have arrived at the job. The results are consistent with: 1) employers updating their beliefs about an employee's ability from prior work

history, 2) occupational human capital being important, and 3) the incentive and commitment arguments for favoring internal hiring. We also show that job and firm characteristics associate with the popularity of various entry channels.

Our study links to the literatures on internal vs. external hiring, employers' asymmetric information, the signaling role of job history, firm- and occupation-specific human capital, as well as the role of firm and job characteristics in hiring decisions.

The findings of this study suggest that the job histories of job candidates, as well as job and firm characteristics, have a central role in who is hired. The association between job history (other than potential work experience) and matching of employees and jobs hasn't been studied before due to considerable data constraints. This paper is descriptive in nature, and therefore calls for further studies on the relationship between job history and hiring decisions. The questions of how (1) jobs to be filled are formed, (2) how employees select to the external job market, and (3) how employers make recruitment decisions are still largely unexplored. What is also outside the scope of this paper is how entrants' job paths and other job market outcomes, such as wages, evolve after the entry to the job.

Appendix

Table A 1: Summary statistics

	Mean	Standard deviation	Min	Max
Years of education	14.30	2.85	9	25
Years of education ²	212.67	83.04	81	625
Experience up to one year	0.08	0.26	0	1
2-5 years	0.15	0.36	0	1
6-15 years	0.35	0.48	0	1
16-25 years	0.25	0.43	0	1
More than 25 years	0.17	0.38	0	1
Tenure up to one year	0.21	0.41	0	1
2-5 years	0.28	0.45	0	1
6-10 years	0.18	0.39	0	1
11-15 years	0.11	0.31	0	1
More than 15 years	0.22	0.42	0	1
Female	0.34	0.47	0	1
Number of job titles to date	1.82	1.14	1	12
Number of employers to date	1.31	0.64	1	9
Years at title so far	4.72	4.48	1	31
Years at level so far	5.18	4.81	1	31
Number of prior promotions	0.43	0.68	0	7
Number of prior demotions	0.21	0.47	0	5
Labor market entrant	0.24	0.43	0	1
Clerical and expert jobs	0.54	0.50	0	1
Managerial and professional jobs	0.46	0.50	0	1
Expanding job	0.74	0.44	0	1
Stable job	0.08	0.27	0	1
Contracting job	0.17	0.38	0	1
Firm size smaller than 50	0.12	0.33	0	1
50-100	0.09	0.28	0	1
100-200	0.11	0.32	0	1
200-500	0.18	0.39	0	1
500-1000	0.12	0.32	0	1
1000-2000	0.10	0.29	0	1
larger than 2000	0.28	0.45	0	1

The number of observations is 468517 for each variable

Table A 2: Multinomial logit analysis of routes to a job

	External promotion	Internal horizontal transfer	External horizontal transfer	External hire from same job title	Internal demotion	External demotion
<i>Human capital:</i>						
Years of education	0.18* (2.12)	0.07 (1.21)	0.33*** (3.71)	0.39*** (5.92)	0.75*** (9.62)	1.30*** (12.63)
Years of education ²	-0.00 (-1.71)	0.00 (1.17)	-0.00 (-1.22)	-0.01** (-3.08)	-0.01*** (-5.36)	-0.03*** (-8.53)
Experience up to one year						
2-5 years	0.04 (0.96)	-0.00 (-0.11)	0.12 (1.94)	0.17*** (3.47)	0.29*** (6.27)	0.42*** (7.09)
6-15 years	0.10 (1.45)	0.12* (2.04)	0.23* (2.26)	0.51*** (7.64)	0.62*** (8.67)	0.83*** (9.07)
More than 15 years	0.17 (1.09)	0.52*** (4.09)	0.59** (2.91)	0.85*** (7.27)	1.36*** (9.52)	1.24*** (6.04)
Tenure up to one year						
2-5 years	-0.14** (-2.96)	0.03 (0.65)	-0.05 (-0.81)	-0.01 (-0.18)	0.08 (1.43)	-0.10 (-1.49)
6-10 years	-0.38*** (-5.17)	0.08 (1.35)	-0.43*** (-4.46)	-0.13 (-1.53)	0.22** (3.27)	-0.43*** (-4.81)
11-15 years	-0.73*** (-6.13)	0.04 (0.40)	-0.51*** (-3.38)	-0.38** (-3.22)	0.35*** (3.31)	-0.72*** (-4.87)
More than 15 years	-0.84*** (-4.17)	-0.29* (-2.11)	-1.08*** (-4.20)	-0.38* (-2.14)	0.20 (1.44)	-0.55* (-2.40)
Female	-0.17*** (-4.02)	0.29*** (7.81)	0.10 (1.80)	-0.36*** (-8.84)	-0.51*** (-11.73)	-0.79*** (-14.08)
<i>Work history:</i>						
Number of job titles to date	-0.07 (-1.30)	0.15*** (3.90)	0.07 (1.27)	-0.14*** (-3.48)	-0.14** (-2.78)	-0.20** (-2.86)
Number of employers to date	0.23*** (6.42)	0.02 (0.77)	0.30*** (6.80)	0.22*** (5.22)	0.12*** (3.57)	0.32*** (8.02)
Years at title so far	-0.05* (-2.14)	-0.12*** (-7.97)	-0.12*** (-5.28)	-0.03 (-1.96)	0.00 (0.08)	0.00 (0.10)
Years at level so far	0.02 (0.92)	0.08*** (5.58)	0.07*** (3.34)	0.02 (1.13)	-0.14*** (-6.24)	-0.12*** (-4.20)
Number of prior promotions	-0.11 (-1.53)	0.76*** (14.02)	0.72*** (8.97)	1.03*** (18.60)	1.99*** (28.92)	1.98*** (24.04)
Number of prior demotions	0.03 (0.50)	-1.14*** (-17.83)	-1.08*** (-12.43)	-0.90*** (-16.01)	-1.81*** (-22.61)	-1.84*** (-18.82)
<i>Job characteristics:</i>						
Managerial and professional jobs	0.26*** (4.63)	-2.27*** (-50.72)	-2.08*** (-33.65)	-2.21*** (-31.44)	-3.88*** (-56.79)	-4.14*** (-49.37)
Expanding job						

Stable job	-0.19*** (-3.34)	-0.00 (-0.01)	-0.16* (-2.18)	-1.38*** (-16.48)	-0.11 (-1.92)	-0.24** (-3.23)
Contracting job	-0.28*** (-4.22)	0.02 (0.33)	-0.21** (-2.73)	-1.05*** (-8.99)	-0.03 (-0.29)	-0.33*** (-4.34)
Firm size smaller than 50						
50-100	-0.00 (-0.04)	0.15* (2.10)	0.11 (1.12)	0.41*** (3.83)	-0.06 (-0.77)	0.17 (1.72)
101-200	0.04 (0.46)	0.10 (1.41)	0.04 (0.43)	0.46*** (3.97)	-0.18* (-2.37)	0.12 (1.16)
201-500	-0.11 (-1.23)	0.20** (3.12)	0.05 (0.54)	0.33* (2.51)	-0.11 (-1.54)	0.12 (1.17)
501-100	-0.30* (-2.44)	0.14 (1.66)	-0.19 (-1.41)	0.14 (0.62)	-0.12 (-1.23)	-0.14 (-1.02)
1001-2000	-0.36** (-2.69)	0.26*** (3.63)	-0.21 (-1.42)	-0.50* (-2.15)	0.02 (0.24)	-0.03 (-0.19)
larger than 2000	-0.27 (-1.49)	0.09 (1.00)	-0.16 (-0.89)	0.41 (1.58)	-0.23** (-2.77)	-0.05 (-0.30)
Industry indicators	Yes	Yes	Yes	Yes	Yes	Yes
Year indicators	Yes	Yes	Yes	Yes	Yes	Yes

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t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

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