WHO LEAVES, WHERE TO, AND WHY WORRY? EMPLOYEE MOBILITY, ENTREPRENEURSHIP AND EFFECTS ON SOURCE FIRM PERFORMANCE†

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We theorize that the value provided by the firm’s complementary assets has important implications for the exit decisions of employees and their subsequent effects on the firm’s performance. Using linked employee-employer data from the U.S. Census Bureau on legal services, we find that employees with higher earnings are less likely to leave relative to employees with lower earnings, but if they do, are more likely to create a new venture than join another firm. Employee entrepreneurship has a larger adverse impact on source firm performance than moves to established firms, even controlling for observable employee quality. Our findings suggest that in knowledge intensive settings, managers should focus on tailoring compensation packages to help minimize the adverse impact of employee entrepreneurship, particularly among high performing individuals. Copyright © 2011 John Wiley & Sons, Ltd.

INTRODUCTION

Human assets often represent an organization’s key competency and source of competitive advantage (Coff, 1997; Lippman and Rumelt, 1982), thus strategic management of human assets is critical particularly in knowledge-intensive industries. As Coff eloquently argued, translating human assets to sustainable competitive advantage is fraught with management dilemmas, given the obvious fact that employees ‘walk out the door each day, leaving some question about whether they will return’ (1997: 375). Employee mobility puts firms in the precarious position of not only losing their competitive advantage but also enabling their competition, given the transfer of the human assets to either established competitors or to ‘spinouts’ (i.e., entrepreneurial ventures created by ex-employees).†1 In addition, the firm’s disadvantage may be amplified by the ability of the exiting

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1 A spin-out is defined as a start-up founded by a former employee of an established firm within the same industry (Agarwal et al., 2004). Employee movement between organizations that have ownership affiliations are typically not considered employee entrepreneurship or mobility events (e.g., Agarwal, Ganco, and Ziedonis, 2009).

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employee to transfer or recreate the complementary assets that were important in value creation.

Because employee mobility may lead to firm disadvantage, the following research questions are critical in the strategic management of human capital: what types of employees are most likely to leave, what types of firms are they most likely to join, and what are the competitive ramifications for the focal firm’s performance? To answer these questions, we develop our theoretical rationale for employee mobility and entrepreneurship decisions by drawing on Teece (1986) and the importance of complementary assets to value created by the core assets. In our context, the core asset refers to the human capital embodied in the focal employee who is at risk of exit, while the complementary assets relate to the other human and nonhuman resources and capabilities (e.g., other employees, routines, opportunities, physical assets, intellectual property, etc.) that are provided by the firm for the creation of value. We posit that the relative bargaining power of the firm with the focal employee will be determined by the employee’s ability to recreate or transfer the complementary assets. This affects employees’ decisions to stay, create a new venture, or join another established firm. Further, we posit that each of these three employee-level decisions lead to differential performance ramifications for the focal firm and are, thus, an important source of performance heterogeneity.

We examine our research questions in the empirical context of the legal services industry—a professional services sector where human assets are critical for the creation and appropriation of value. Using data derived from a custom extract of the Longitudinal Employer-Household Dynamics (LEHD) Project² used at the U.S. Census Research Data Center in Chicago, we test our predictions about who leaves, where they go, and the impact of the mobility events on source firm performance. At the individual employee level, we find support for our hypotheses that higher income earners are less likely to be mobile, but if they do leave, they are more likely to be involved in founding a spin-out firm. At the firm level, we find that employee moves to a spin-out have a larger adverse impact on source firm performance than employee moves to established firms, even after controlling for observable employee quality differences. We also find that the adverse impact of employee entrepreneurship on source firm performance increases with employee earnings.

In addressing these questions, we contribute to the literature on strategic human capital management and entrepreneurship. We connect human capital and strategy by extending Teece’s (1986) framework of complementary assets to the micro-level mobility decisions of individual employees and the impact of these decisions on macro-level firm outcomes. Through this framework, we augment the understanding of how employees and employers generate and appropriate value and the extent to which complementary assets may affect each party’s bargaining power vis-à-vis the other. Our research also contributes to the connection between strategy’s knowledge-based view and research on knowledge spillovers through employee mobility and employee entrepreneurship by simultaneously examining both the determinants and the effects of knowledge transfer through employee moves to established firms versus employee entrepreneurship. Thus, our research suggests that strategic management of complementary assets may help mitigate the potentially negative performance consequences of moves, and also enable firms to assess the differential likelihood of moves to rivals versus to spin-outs. Further, in keeping with Schumpeter’s (1934) concept of creative destruction, we explicitly capture the destruction of source firm value wrought by the creation of spin-outs. There are greater pressures on source firms due to employee movement to spin-outs rather than to established firms. As a result, new venture creation may be more harmful to the source firm than employee mobility among already existing firms.

THEORETICAL FRAMEWORK AND HYPOTHESES

Human assets have been recognized as an integral part of value creation, and their value increases with the knowledge intensity of an industry (Coff, 1997; Lippman and Rumelt, 1982). Since employees can quit at will, Coff (1997) highlighted the uncertain ‘ownership’ by firms of valuable human assets. Coff questioned whether competitive advantage based on human assets is truly sustainable, absent systems to cope with the associated management dilemmas. In doing so, Coff’s work

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² For details, see http://lehd.did.census.gov/led/library/tech_user_guides/overview_master_zero_obs_103008.pdf
underscored the need for research that integrates micro-level human resource management (HRM) and macro-level strategic management to help identify factors that impact not only value creation but also the extent of value appropriation by each of the co-creators: the focal individual and the firm. From a macro perspective, greater appropriation of value by the employees as stakeholders in the firm implies that common measures of firm performance such as profitability may underestimate the true extent of value creation of the firm. Further, by undertaking such an integration, we can inform micro-level HRM strategies regarding compensation of heterogeneous employees based on their relative bargaining power by explicitly accounting for the macro strategic implications of employee mobility and entrepreneurship, given the rich literature stream that underscores the competitive ramifications of employee exit (Phillips, 2002; Somaya, Williamson, and Lorinkova, 2008; Wezel, Cattani, and Pennings, 2006; Aime et al., 2010).

We integrate these perspectives by beginning with a framework that models differences in organizational and employee bargaining power as a function of two dimensions: the importance of a firm’s complementary assets to value creation, and the ability of an employee to transfer or recreate the complementary assets outside the firm’s boundaries.

Complementary assets, relative bargaining power, and value appropriation in the employee-employer relationship

In his seminal article, Teece (1986) identified the importance of complementary assets to core technological know-how in both the creation and appropriation of value. While largely used to explain value appropriation by innovating firms (Franco et al., 2009; Gans and Stern, 2003; Tripatis, 1997), by linking it to the classic articles by Alchian and Demsetz (1972) and Klein, Crawford, and Alchian (1978), this framework can also shed light on human resource management issues. Alchian and Demsetz (1972) discuss the importance of the firm to an employee for creating value, since it facilitates the contractual relationships between the various owners of the complementary inputs that are required jointly for production. Further, Klein et al. (1978) discuss how firms’ ownership of specialized assets (e.g., brand name and reputation) increases the value that can be created by the employee in conjunction, rather than in isolation.

The complementarities in this employee-employer value-creating relationship led to Hart’s insightful observation: ‘Control over non-human assets leads to control over human assets’ (1995: 58, italics in original). Thus, we can enhance Teece’s (1986) depiction of the interaction between core and complementary assets to include the case wherein a firm’s complementary assets are important to the ‘core’ knowledge possessed by the employee at risk of exit (the focal employee). The complementary assets may consist of organizational knowledge (e.g., codified routines, knowledge embodied in products and processes, and intellectual property rights), nonhuman complementary assets (e.g., physical capital, contractual relationships with buyers/suppliers, brand equity, and reputation), and human complementary assets (e.g., tacit knowledge embodied in other employees). Firms can appropriate ‘quasi-rents’ based on that portion of value that employees are unable to create absent these complementary assets, (Klein, et al., 1978). However, the ‘portability’ of these complementary assets, or the extent to which an employee is able to transfer or recreate complementary assets, will in turn limit the firm’s ability to appropriate these quasi-rents.

We depict the relationship between relative bargaining power and resultant value appropriation between the firm and the employee in Figure 1. The x-axis in Figure 1 represents the relative importance of a firm’s complementary assets to the focal employee’s human assets for value creation, and the y-axis represents that employee’s ability to recreate or transfer these complementary assets outside the firm’s boundaries. The relative bargaining power of the firm and the employee is a function of whether the firm’s complementary assets are important for value creation, and of whether the employee can walk away with these complementary assets or recreate them at low cost after exit. Accordingly, we differentiate three areas in Figure 1.

If complementary assets are important to value creation and not easily reproducible by the employee outside a firm (e.g., intellectual property rights on complementary knowledge or specialized physical assets), the firm can prevent an employee from competing with it, thus limiting the employee’s outside options. As a result, the firm will possess greater bargaining power — allowing it...
to appropriate a higher share of the value created (the area labeled ‘Firm advantage’ in Figure 1). On the other hand, even when the firm possesses the necessary complementary assets, an employee who is able to recreate or transfer these to a recipient firm will have higher bargaining power and may appropriate much of the value created (‘Employee advantage’ in Figure 1). As a result, the employee has a bargaining advantage over the employer. The middle area represents a situation of bilateral bargaining power: the firm’s complementary assets are important for value creation, and the focal employee has limited ability to recreate these complementary assets. Thus, the ability of either the employee or the firm to appropriate value is limited.

Who leaves? Types of human assets and propensity for exit

In examining questions related to employee propensity to exit, our key underlying construct is the ability of an employee to generate value for the employer. The construct is highly correlated with employee earnings and related to many factors, including the employee’s innate ability, education, and experience; motivation to work; social network (Shaw et al., 2005); and position and responsibilities in the firm (Elfenbein, Hamilton, and Zenger, 2010; Castanias and Helfat, 2001; Williams and Livingstone, 1994; Zenger, 1992). Variation in the above factors among individuals also results in heterogeneity in their generation of value within a firm. Since the human assets embodied in a focal employee (core knowledge) determine what is complementary for value creation, both dimensions represented in Figure 1 vary with the focal employee’s human assets. Employees with low human capital are likely to contribute less to total created value than those with high human capital. Further, they are less likely to recreate or transfer complementary assets, thus diminishing their bargaining power and ability to appropriate value. Accordingly, they fall into the ‘Firm advantage’ area of Figure 1. In contrast, strong skills, education, experience, and work ethic imply higher levels of knowledge embodied in employees. Further, these factors are correlated with promotions, which increase individuals’ control and authority within the firm (Castanias and Helfat, 2001; Huselid, 1995; Phillips, 2002; Zenger, 1992). These employees have higher bargaining power because of their ability to replicate necessary complementary assets. They can credibly threaten to exit and transfer complementary resources and opportunities from a firm. Transferred resources may include technologies identified while working within the firm (Agarwal et al., 2004; Bhide, 1994; Klepper and Sleeper, 2005), supporting team members (Groysberg, Nanda, and Prats, 2009), and social networks (Burton, Sørensen, and Beckman, 2002). Transferred opportunities may include attracting clients (i.e., a firm’s ‘book’) to a new firm (Stull, 2009; Taylor, 2000, 2005), a focus on niche industry segments (Agarwal et al., 2004), and creation of new products and practices (Mondics, 2009; Taylor, 2000). Consequently, high value generators have high bargaining power vis-à-vis their firms and capture most of the value they create. Thus, they are likely to be in either the ‘Bilateral bargaining power’ or ‘Employee advantage’ area of Figure 1.

We posit that, although the exit of employees with high human capital diminishes firm value more than does the exit of those with low human capital, the former are less likely to actually exit, given their increased ability to appropriate value. This view is consistent with evidence from the HRM literature that firms provide both pecuniary and nonpecuniary benefits to such employees to reduce turnover (Williams and Livingstone, 1994; Zenger, 1992). Firms’ sharing ‘rents’ with high-performing employees in the form of higher wages not only increases employees’ perceptions of distributive and procedural justice (McFarlin and
Sweeney, 1992) but also creates a penalty for exiting (Coff, 1997; Weiss, 1990; Zenger, 1992). In addition, since employees with higher levels of knowledge value the intrinsic satisfaction of their work, autonomy, and input (Raelin, 1991), firms can optimize the fit of their complementary assets to employees’ core knowledge, and create strong internal ties (Dess and Shaw, 2001; Lee et al., 2004) to better motivate these people to stay and perform well (Hackman and Oldham, 1980).

The above human capital management strategies translate into high-performing employees having enhanced ability to appropriate value and thus gain high earnings, reducing their desire to leave and incur the costs and risks of mobility. Thus, even though high earners are more able to transfer or recreate a firm’s complementary assets, they are less likely to do so. Coff (1997) provided case study evidence that although high-producing security brokers could leave their current firms with 95 percent of their clients and business, their turnover rate was less than 10 percent, given their firms’ ‘rent-sharing’ in the form of pay, performance-based incentives, and high participation in critical management-related decisions. This argument leads us to our first baseline hypothesis:

**Hypothesis 1:** The relationship between earnings and the likelihood of employee mobility is negative.

**Where to? Employee moves to spin-outs vs. established firms**

There are important differences between an employee moving to an established firm and employee entrepreneurship. While moving to another established firm does entail adjustment costs, the risks and challenges of engaging in entrepreneurship are different. Starting a new enterprise implies undertaking the risk of operating a new business, given the daunting statistic that over a third of new firms do not survive for five years (Agarwal and Audretsch, 1991). Drucker (1985) attributed the high failure rate of entrepreneurial enterprises not to the quality of their underlying ideas or innovations, but to the lack of business and management skills among their founders. Anecdotally, Gordon Moore attributed spin-out Shockley Semiconductor’s failure to its lack of management experience (Moore and Davis, 2001). Thus, when contemplating spinning out, the challenges facing an employee relate to the creation of an organizational structure that can generate synergies between their knowledge and the necessary complementary assets.

We posit that higher performers/earners are more likely to found start-ups than other employees. First, while the literature in HRM and entrepreneurship have developed in parallel, our integration reveals that many of the same individual characteristics positively associated with job performance and, thus, individual earnings (Parsons, 1977; Castanias and Helfat, 2001), are also positively associated with entrepreneurship. In the HRM literature for instance, meta-analyses of the relationship between personality traits and job performance find that conscientiousness, emotional stability, and extraversion are strong positive predictors of job performance (Barrick and Mount, 1991; Hurtz and Donovan, 2000; Salgado, 1997). Entrepreneurship researchers have also found that these same traits are meta-analytically associated with individuals’ intentions of forming their own firms (Zhao and Seibert, 2006; Zhao, Seibert and Lumpkin, 2010). Braguinsky, Klepper, and Ohyama (2009) connect employees’ entrepreneurship ability to their ability to create value for their employer. In addition, intelligence is a strong predictor of job performance in the HRM literature (Schmidt and Hunter, 1992; Ree and Earles, 1992), and for new venture formation because it increases an individual’s absorptive capacity (Cohen and Levinthal, 1990; Shane, 2005) and thus the ability to recognize new opportunities (Knight, 1921; Shane and Venkataraman, 2000) and exploit them (Hebert and Link, 1989).

Second, unlike joining an established firm, starting a new venture requires an individual to address issues related to optimal organization. In this context, the individual’s ability to transfer or recreate complementary assets (the y-axis of Figure 1) is key. Since earnings are typically correlated with ability, experience, and status, high earners are better than low earners at replicating complementary assets and transferring resources and opportunities from the source firm (Agarwal et al., 2004; Bhide, 1994; Burton, Sorensen, and Beckman, 2002; Klepper and Sleeper, 2005; Mondics, 2009; 3 Groysberg et al. (2009) and Elfenbein et al. (2010) provide empirical evidence of this relationship, but do not offer any theoretical explanation of their empirical findings.)
Taylor, 2005; Stull, 2009). Accordingly, high earners founding new firms have higher value creation potential and lower set-up costs and risks. In contrast, mobile employees with lower earnings may be limited in their ability to replicate complementary assets effectively, and they may be more likely to move to established firms rather than to found start-ups.

Third, it is easier to transfer or replicate the resources and opportunities to ‘new soil’ than trying to graft them onto an existing organization. Existing organizations may be characterized by complex internal networks, and the existing bureaucratic structure may retard the employee’s ability to recreate or transfer the complementary assets. Further, since high earners typically accumulate more firm-specific skills, resources, and idiosyncratic knowledge (Coff, 1997; Williamson, 1975) relative to low earners, they will experience greater challenges in integration and reconfiguration of their resources and knowledge in an existing organization. The lack of a bureaucratic structure in a new firm allows greater ability to transfer and replicate the necessary complementary assets. For example, Ganco (2010) found that team mobility (i.e., transfer of complementary human assets) is higher to a start-up rather than an existing firm. Similarly, while the link between knowledge from one established firm to another after mobility events is neither direct nor clear, Agarwal et al. (2004) showed that spin-outs do inherit knowledge from their parents through their founders.

While the above reasons relate to the ability of high earners to transfer core and complementary assets to a new venture relative to an established firm, differences in motives may be salient to the choice of where employees go. Since high earners can appropriate most of the value they create, their motivation for exit could be twofold. First, they may believe they could generate or appropriate even more value outside their current firm because they see underexploited opportunities, poor fit with their skills, and other constraints at that firm. These inertial tendencies are likely to exist at other established firms, and a move might even exacerbate them to the extent that differences in corporate culture create a difficult match (Coff, 1997). Thus, if motivated by frustration with parental inertia and perception of underexploited opportunities (Agarwal et al., 2004; Klepper and Thompson, 2010), employees are more likely to move to spin-outs than to existing firms. Second, high earners are likely to have diminishing marginal returns to pecuniary gain and may value nonpecuniary factors such as job satisfaction and autonomy more than low earners (Blanchflower and Oswald, 1998; Gompers, Lerner, and Scharfstein, 2005; Hamilton, 2000; Puri and Robinson, 2007; Teece, 2003). Starting a new firm enables them to fulfill nonpecuniary aspirations better than moving to an existing firm with constraining norms.

In sum, we expect employees with high earnings to be less likely to move, but if they do move, they are more likely to start new firms. Accordingly,

**Hypothesis 2:** Conditional on mobility, employees with greater earnings are more likely to join spin-outs than established firms.

**Why worry? Impact on source firm performance**

How do the micro-level mobility choices of employees affect macro-level firm performance? We turn to the analysis of the impact of moves to established firms and to spin-outs on source firm performance. Regardless of where an employee goes, the mobility event represents the source firm’s loss of the focal human asset as a critical resource (Phillips, 2002). The competitive impact on the source firm of this loss is a function of the recipient firm’s ability to capitalize on the focal human asset and is greater for employee movement to a spin-out than to an established firm because it is harder to assimilate the employee’s accumulated firm-specific skills, resources, and idiosyncratic knowledge at an established firm (Coff, 1997; Williamson, 1975).

Moreover, moving to a spin-out also results in a greater replication and transfer of complementary assets, thus impacting the source firm more adversely than a move to an established firm. Employees who start a firm are more motivated to transfer the necessary resources and capabilities given the high risk and uncertainty associated with starting a new venture (Agarwal and Audretsch, 2001; Drucker, 1985, Khessina and Carroll, 2008). While employees who move to established firms have the relative luxury of leveraging the latter’s existing complementary assets, employee entrepreneurs need to recreate complementary assets. Wezel et al. (2006) hypothesize that the replication of a source firm’s organizational knowledge and routines in a spin-out is
a likely cause of the greater adverse impact of employee moves to spin-outs versus those to established firms. More importantly, employees are better able to transfer both human and nonhuman complementary assets to spin-outs than to established firms (Agarwal et al., 2004). In particular, supporting team members are important complementary assets (Groysberg et al., 2009) that are more susceptible to transfer to a start-up than to an existing firm (Ganco, 2009). Such transfers will have a larger negative impact on the source firm’s performance than transfers to established firms.

The transfer of nonhuman complementary assets also increases the impact of employee entrepreneurs on their parent firms. Research in relationship marketing highlights the importance of employees as the ‘face of the firm,’ even in firm-firm interactions (e.g., business-to-business sales), and the importance of employees in both firm customer relationships (e.g., end-consumer sales) and professional services (provider-customer) relationships (Berling, 1993; Crosby, Evans, and Cowles, 1990; Iacobucci and Ostrom 1996; Solomon et al., 1985). Similarly, employees starting new firms can capitalize on their relationships with customers and cash in on their parent firm’s reputation, since brand loyalty is connected to the employees rather than to the firms (Beatty and Lee, 1996), and customers are more willing to follow the employees than to stay with the parent (Beatty and Lee, 1996; Stull, 2009; Taylor, 2000, 2005).

The transfer of complementary assets and opportunities is damaging to a source firm. Since complementary assets are more likely to be transferred to start-ups than to existing firms, we theorize that employee moves to spin-outs have a larger negative impact than moves to established firms. Consequently, we propose:

*Hypothesis 3:* The adverse impact on source firm performance of employee mobility is greater for moves to spin-outs than moves to established firms.

Our final hypothesis on the impact of mobility on source firm performance directly flows from the linkages among the previous hypotheses. The loss of high value generating employees has a higher detrimental effect on a firm’s performance than the loss of low value generating employees, since in the former case the parent firm loses employees who are core to its creation of value (Phillips, 2002). This is supported by research that points to the impact of inadequate chief executive officer succession planning on firm value (Davidson, Nemec, and Worrell, 2001; Harris and Helfat, 1998). At the micro-level, we reasoned in Hypothesis 1 that employees with higher ability to generate value have greater ability to transfer and/or recreate complementary assets; and, in Hypothesis 2 we argued that they are more likely to join spin-outs than established firms. Further, employee mobility adversely impacts parent firm performance through the transfer/replication of complementary assets, and exiting employees moving to a spin-out have greater ability and incentive to transfer/replicate complementary assets than movers to established firms.

If higher ability employees are more likely to create spin-outs and more able to transfer or recreate complementary assets, it follows that the difference in the impact on source firm performance associated with an exit to an established firm versus one to a spin-out increases with the exiting employee’s ability. Employees with low value-generating ability also have low ability to replicate complementary assets. As the ability to generate value increases, employees are also able to transfer a larger pool of complementary assets and opportunities. Given higher absolute differences in both the core and complementary assets that may be transferred to a spin-out relative to an established firm, the difference in the impact of a move to spin-out and a move to an established firm increases with the mobile employee’s earnings. This reasoning leads to the following:

*Hypothesis 4:* The adverse impact on source firm performance of employee moves to spin-outs relative to moves to established firms increases with the earnings of the mobile individuals.

**DATA AND METHODOLOGY**

**Context: the U.S. legal services industry**

We tested our hypotheses using data from the legal services industry. We focus on a professional service context due to its knowledge intensiveness and the critical role of human assets. Professional services, which include legal, financial, management, consulting, education, and health care, are a large and growing portion of the economy (Buera
and Kaboski, 2008). Services constituted 68 percent of the U.S. gross domestic product (GDP) in 2007 (relative to 19 percent for manufacturing), and within the services sector, professional services contributed to 49 percent of GDP in 2009 (Bureau of Economic Analysis, 2010). Since professional services are human capital intensive, portability of complementary assets is relatively easier than in manufacturing industries. In legal services, as in other professional service industries, complementary assets are likely to be embodied in people and human assets are more important than physical assets (Teece, 2003). Since complementary human assets are more easily transferable than complementary physical assets (Coff, 1997), mobility and spin-out generation is common in the professional services sector (Teece, 2003). Further, employment contracts in legal services exclude non-compete clauses and, for lawyers who have passed relevant bar exams—key players in the industry—the barriers to mobility and entry are low. As a result, the costs associated with mobility are relatively low for employees (within the borders of a state) and new firm creation rates are high. Thus, the legal services industry represents an active environment in which to study issues related to the strategic management of talent.

The dominant organizational design in legal services is partnership, wherein partners own firms and almost all revenues are returned to employees, including partners, as taxable earnings. The majority of these firms’ employees fall into the following categories: equity partner lawyers; associate and salaried lawyers; assistants, secretaries, and paralegals (staff). Lawyers typically account for approximately 80 percent of employees (Wymer, 2009). Lawyers are typically promoted to partners within six or seven years of joining their firms, at which point they can earn a share of revenues. These are divided either evenly or on the basis of individual contribution (Gilson and Mnookin, 1985). Notably, an important driver of mobility is the ‘tournament’ employment system, in which associates who are not promoted are typically forced to leave. To rule out alternative explanations related to tournament-driven mobility for Hypotheses 1 and 2, we conduct robustness checks by examining sub-samples of employees that are not likely to be at risk of involuntary turnover (Please see Table 4 Panels 3–6 in the Results section, and discussion below).

Data source

The data for the study are derived from the LEHD Project. Our custom extract includes linked employer-employee data drawn from state-level unemployment insurance (UI) records and several data products from the U.S. Census Bureau. Every quarter, organizations that pay into their state’s UI fund submit form ES-202, which lists all employees covered by the UI program, their taxable earnings, and firm characteristics. From these mandatory submissions, the LEHD project constructs both employer characteristics files, which include longitudinal records of firm-level characteristics, and employment history files, which include longitudinal records of all employment ‘spells’ (periods), including employer name and taxable earnings, for all employees covered by UI. Individual characteristics files, containing indicators like gender, date of birth, race, ethnicity, and education, are drawn or imputed from the Social Security Administration’s ‘Personal Characteristics Files,’ the decennial census, the Current Population Survey, and the Survey of Income and Program Participation. Together, the longitudinal data is rich with individual-, firm-, and dyad-level characteristics.

Our data identify all individuals employed in U.S. legal services in the following states: California, Florida, Illinois, New Jersey, North Carolina, Oregon, Pennslyvania, Texas, Virginia, and Wisconsin. The time frame depends on when the individual participating state chose to enter the LEHD program; the earliest states entered the program in 1990, and other states entered across subsequent years up to 1994. Since the data are drawn from mandatory filings, they cover the entire universe of

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4 See http://www.bea.gov/industry/xls/GDPbyInd_VA_NAICS_1998-2010.xls. The shift from manufacturing to services in developed nations has been rising since the mid-20th century (Baumol, 1967).

5 State-specific bar exams cause low transferability of lawyers’ credentials across state borders but high transferability within state borders.

6 Because the data were collected at the state level, the firm identifier is actually a firm-state identifier. As a result, our definition of firm includes only the activities of a given firm located within a given state’s borders. Data limitations precluded linking firms across state borders, so a firm that operated in states x and y was disaggregated into two records: the firm’s activities located in state x and the firm’s activities located in state y. The high cost of crossing state borders in the legal services industry minimizes the impact of this issue on our empirical results.
legal services firms in the 10 states. This universality permits us to track interfirm employee mobility and to identify new firms. Because the data are restricted to legal service firms, the analysis is limited to focusing only on employee mobility and employee entrepreneurship where both the source and the target firm are legal service firms. As many lawyers are employed in the public sector or are members of an in-house legal staff, this restriction leads to under-measurement of employee mobility events because we do not include employee mobility where the employee moves from or moves to a different industry. This under-measurement ultimately provides conservative tests of our hypotheses. All results have been cleared for disclosure by the U.S. Census Bureau to ensure that no individual respondent or firm could be identified.

We draw a random 25 percent sample of the employees in the data for our tests of Hypotheses 1 and 2. We restrict that sample to employees who earned more than $25,000 per year, and were employed at a firm that both contained more than five people and did not exit the data in that or the subsequent year. The first restriction excludes employees with a weak attachment to the labor market; the second restriction excludes employees of very small firms that contribute a small percentage of total industry revenues (Gilson and Mnookin, 1985), and the third restriction excludes employees of firms that die within two years of the individual moving. This last restriction is particularly important to understanding employee mobility from healthy firms, given that employees leaving dying firms may be systematically different from employees who leave a healthy firm.

For our tests of Hypotheses 3 and 4, we aggregated all the employee-level data to the firm level. As in the sample used to test Hypotheses 1 and 2, we exclude employees of very small firms (less than five people) and of dying firms (firms that exit within the next two years) to eliminate their effects on the measured impact of mobility on firm performance. We also exclude firm observations with revenues per employee of less than $10,000 or more than $1,000,000. Exclusion of firms with more than $1,000,000 revenue per employee eliminates a handful of observations where firm revenues have a dramatic temporary spike. Because firms with such a dramatic spike in earnings may be the firms that rely most heavily on the ability of their human assets to generate value, excluding these observations provides a conservative test of our hypotheses. Finally, we exclude firm observations that lost more than 20 employees in any payroll class to an established firm or to a spin-out in a given year. This last restriction allowed us to exclude mergers, acquisitions, and administrative recoding of organizational identifiers.

**Estimation methodology**

For the mobility analysis, we estimated a series of linear probability models with dependent variables that were dummies indicating general mobility and mobility to a spin-out. Firm-year fixed effects were included to absorb any variation owing to unobserved characteristics, and use of robust standard errors accounted for inherent heteroskedasticity. Computing constraints drove our choice of a linear probability model over a conditional logit model, since the large sample sizes made conditional logit computationally infeasible. Out-of-sample predictions were extremely rare in our data, which suggests that the model performed acceptably. Robustness checks confirmed consistency of the linear probability results with panel logit model results for a random 2.5 percent sample of the data.

For the source firm performance analysis, we estimate a series of fixed-effects linear regression equations of firm performance as a function of the intensity of different types of employee mobility and firm characteristics. These allow us to assess the impact of the quantity and quality of exiting employees on source firm performance one year after a mobility event. Our explanatory variables include number of exiting employees, their combined pay, and the number in different pay classes. We include firm fixed effects to absorb any variation caused by unobserved firm characteristics. In each firm performance specification, we compare the effect of employees lost to spin-outs to

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7 This under-measurement is likely to be small. Sauer (1998) shows that lawyers in the legal services industry tend to remain in the same industry (only 11% of the mobility events are from legal services to business sector [in-house counsel] and 6% to public sector).

8 An administrative recode, or changes in a firm’s identification number, are infrequent appearances in the data as large mobility events where all of a firm’s employees move from an existing firm to a new firm.

9 All analyses were limited by the time and computing power available onsite at a Census Research Data Center.
the effect of employees lost to established firms. The coefficients on these mobility measures capture the impact on firm performance of each type of event relative to the baseline of no mobility. As a result, comparing the two coefficients represents a difference-in-differences approach. The difference in coefficients captures the effect on firm performance of losing an employee to a start-up (relative to no mobility) minus the effect on firm performance of losing an employee to an established firm (relative to no mobility). As we discuss the results, we focus on the comparison of the two mobility measures to emphasize the differential effect on firm performance of mobility to start-up relative to mobility to established firm.

**Variables**

**Employee mobility**

The dependent variable for tests of Hypothesis 1, *employee mobility*, is a dummy variable coded 1 if an employee’s dominant employer changed since the previous year and 0 otherwise. A dominant employer is the one at which the employee earned the most during the year.

**Employee exit to spin-out**

This dependent variable for testing Hypothesis 2 is a dummy coded 1 if an employee’s dominant employer changed since the previous year and the new employer appeared in the data for the first time in that year. This measure of *exit to spin-out* is broader than the typical definition of a spin-out founder. To the extent that nonfounding employees who join spin-outs are similar to employees who move to established firms, our results differentiating between moves to established firms and moves to spin-outs should be seen as conservative. That is, the presence of employee exits to established firms should bias our analysis against finding significant differences between the two categories. Alternatively, nonfounding employees who join a spin-out during the first year of its existence (especially at higher levels of earnings) may be driven by motives and preferences similar to those of founder(s) — which may translate into similar characteristics and impact on the parent firm. If that is the case, in the context of our theoretical questions, the difference between founding and nonfounding employees who join early is less crucial.

**Firm performance**

The dependent variable for testing Hypotheses 3 and 4, *firm performance*, is measured as revenues per employee. In the partnership model, almost all revenues are returned to employees, which include partners, as taxable earnings. By aggregating the earnings of all employees inside a firm, we could construct its total revenues (less noncompensation costs and set-asides for future years). To compare firms of different sizes, we divide revenues by number of employees to obtain the average firm revenue generated per employee (including partners, associates, and staff). The firm performance measures are calculated at least one year after the measured mobility events, thus the firm performance measures are based on the earnings of the retained workforce and any individuals hired to replace the moving employees. Because this allows for replacement of individuals who left, this is a conservative measure of the impact of mobility.

**Employee earnings**

Our key explanatory variable for Hypotheses 1 and 2, *employee earnings*, is measured as all forms of taxable compensation that an employee received in a given calendar year; including salary, bonuses, and other reported income.

**Firm-level mobility**

The key explanatory variables for Hypotheses 3 and 4 are measures of firm-level mobility. We aggregate our exit measures over five years to capture the lagged effect of employee mobility on firm performance and also to facilitate disclosure review at the Bureau of the Census. We construct two different variables to capture firm-level mobility. First, we count the number of unique individuals who leave a firm to join another established firm in each measurement year and the four years prior to it. We do the same for employees who leave to join a spin-out. As a result, for every firm-year in the data, our measure captures the human assets that exited to established firms and to spin-outs. Our second measure is based on employee mobility at different levels of employee earnings. We sort exiting employees into these earnings classes: $25,000–$100,000, $100,000–$300,000, $300,000–$500,000, and $500,000+ and count the number of movers to established firms and spin-outs in each class over the past five years.
Control variables

Demographic characteristics and observable human assets have been shown to play an important role in the employee mobility decision. Specifically, employee mobility is impacted by age and tenure (Topel and Ward, 1992), and varies by gender (Loprest, 1992), race (Raphael and Riker, 1999), and education (Buchinsky et al., 2010). To control for these underlying effects, we include measures for the quadratic effects of age and tenure, and linear effects of gender, race, and years of education. Years of education is a continuous variable imputed by the Census Bureau. Gender and race are dummy variables (male/female and white/nonwhite, respectively). Age and tenure are continuous variables measuring time since birth and first year of employment at current firm, respectively. We include a dummy for individuals with less than one year of tenure to capture the effect of employees who do not have strong ties to the labor market. Since our data begins in the middle of the careers of some employees, tenure is ‘left-censored’ and under-measured for employees who began working in the industry before the data begins. To address this issue, we construct a dummy indicating potentially left-censored tenure spells.

Similarly, the human assets possessed by the firm have been shown to be an important predictor of firm performance (Hitt et al., 2001). Firm-level controls for human assets include both measures for demographic composition and variables associated with human capital. We proxy for demographic characteristics with gender and race and for human capital differences with age and education (Becker, 1964). We control for the means of the observed demographic and human capital variables measured over all of a firm’s employees. Specifically, we measure mean age, education, and percentages of whites and men in each firm in the fourth quarter of each year. Because workforces change over time as firms hire and lose employees, year averages would have been biased, overcounting employees at firms with high employment fluidity. Calculating within just one quarter minimized the impact of fluidity on our measures, but we could still have overcounted employees, because the total number employed over a quarter might exceed a firm’s steady-state employment. To account for the effect of unobserved characteristics of the firm on firm performance, we also include a firm fixed effect that controls for time-invariant unobserved differences across firms.

Tables 1 and 2 give descriptive statistics and correlations for the individual-level mobility data and the firm-level performance data, respectively. There is no evidence of high correlations (except for variables with their squared terms). As shown in Table 1, 10 percent of employees changed their dominant employer in a given year, and 1 percent left to go to spin-outs in any given year. The two rates imply that 10 percent of those exiting go to spin-outs. Our sample was largely white (84%) and female (56%), and it included many short-tenured employees. The average age was 40 years; average education was 14 years of schooling; and average earnings were $67,047 per year. Per Table 2, the average revenues per employee for firms were $63,007.10 The workforce had an average age of 38 years, average education of 13.85 years, and average composition of 83 percent white, and 30 percent male. Every year, the firms lost an average 8.13 employees with total pay of $301,705 to other established firms and lost 0.77 employees with total pay of $36,838 to spin-outs. On average, those exiting to established firms earned $37,089, and those exiting to spin-outs earned $47,704.

RESULTS

Table 3 contains our results on employee mobility decisions. Model 1 in Table 3 provides estimates of the impact of employee characteristics on employee mobility. Model 2 captures the impact of employee characteristics on the decision to go to a spin-out, conditional on mobility. Model 1 indicates that employee earnings are negatively related to employee mobility, and the square of earnings is positively related to mobility. Combining both statistically significant quadratic effects, the marginal effect of earnings on mobility is negative for employees earning between $0 and $5,200,000. Since $5,200,000 is over 45 standard deviations away from the mean of employee earnings ($67,047), this finding thus suggests strong support for Hypothesis 1. In terms of economic significance, the marginal effects reveal that a 35-year-old male with 18 years of education and

10 Individual-level measures and firm-level measures differ due to the different sampling frames for the individual data and the firm-level data and due to the churning concerns raised earlier.
### Table 1. Descriptive statistics: employee data

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mobility</td>
<td>0.10</td>
<td>0.29</td>
<td></td>
</tr>
<tr>
<td>2. Mobility to spin-out</td>
<td>0.01</td>
<td>0.11</td>
<td></td>
</tr>
<tr>
<td>3. Age</td>
<td>40.10</td>
<td>10.78</td>
<td>-0.05</td>
</tr>
<tr>
<td>4. Years of education</td>
<td>14.57</td>
<td>2.53</td>
<td>-0.02</td>
</tr>
<tr>
<td>5. Years of tenure</td>
<td>2.21</td>
<td>2.60</td>
<td>-0.08</td>
</tr>
<tr>
<td>6. Tenure &lt; 1 year?</td>
<td>0.49</td>
<td>0.50</td>
<td>0.35</td>
</tr>
<tr>
<td>7. Tenure is censored?</td>
<td>0.84</td>
<td>0.37</td>
<td>-0.02</td>
</tr>
<tr>
<td>8. Male</td>
<td>0.43</td>
<td>0.50</td>
<td>-0.04</td>
</tr>
<tr>
<td>9. Annual earnings ($100,000s)</td>
<td>67.05</td>
<td>112.36</td>
<td>0.00</td>
</tr>
<tr>
<td>10. White</td>
<td>0.43</td>
<td>0.50</td>
<td>-0.04</td>
</tr>
<tr>
<td>11. Annual earnings ($1,000,000s)</td>
<td>67.05</td>
<td>112.36</td>
<td>0.00</td>
</tr>
<tr>
<td>12. Mobility</td>
<td>0.10</td>
<td>0.29</td>
<td></td>
</tr>
<tr>
<td>13. Mobility to spin-out</td>
<td>0.01</td>
<td>0.11</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** N = 767,307.

10 years of tenure who earns $100,000 per year has a 5.8 percent probability of mobility, and an employee with the same characteristics who makes $300,000 per year has a 3.8 percent probability of mobility. The difference is a 35 percent drop. In addition to the earnings effects, we also find that older employees, those with longer tenure, and men are all less likely to exit.

In Model 2 of Table 3, the sample is restricted to the mobile employees, and the results on the predictors of moves to spin-outs are conditional on mobility. The estimates demonstrate that employee earnings and its quadratic term are positively and negatively related, respectively, to employee entrepreneurship. Taken together, the marginal effect of earnings on employee entrepreneurship conditional on mobility is positive for employees earning less than $3,500,000 (which is 30 standard deviations from mean employee earnings), thereby supporting Hypothesis 2. Again, to examine the economic significance of the estimates: a 35-year-old male with 18 years of education and 10 years of tenure who earns $100,000 per year and leaves his current employer has a 16.6 percent probability of joining a spin-out, but an employee with the same characteristics who makes $300,000 per year has a 21.8 percent probability of doing so. This difference represents a 31 percent increase in the likelihood of employee entrepreneurship, conditional on mobility. As before, conditional on mobility, male and longer-tenured employees are more likely to move to spin-outs.

The above results are based on the full sample of legal services employees, including clerks, paralegals, administrators, and other non-lawyer employees. The results reported in Table 4 (Panels 1 and 2) focus the analyses on employees who are likely to be attorneys. Attorneys are more likely than all other types of legal services employees to have compensation levels greater than $100,000 (Table 4, Panel 1) and have 16 or more years of

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11 For a 35-year-old male with 18 years of education and 10 years of tenure earning $100,000 per year, the probability of staying with his employer is 94.2 percent; that of a move to an established firm is 4.8 percent; and that of a move to a spin-out is 1.0 percent. For an employee with the same characteristics who earns $300,000 per year, the probability of staying with his employer is 96.2 percent; that of a move to an established firm is 3.0 percent; and that of a move to a spin-out is 0.8 percent.

12 Due to space constraints, only partial tables are included. Full tables and additional information on specifications are available from the authors.
Table 2. Descriptive statistics: firm data

<table>
<thead>
<tr>
<th>Variable</th>
<th>Means</th>
<th>Standard deviation</th>
<th>Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cumulative payroll per employee in $t-1</td>
<td>63.01</td>
<td>47.87</td>
<td>1.00</td>
</tr>
<tr>
<td>2. Cumulative payroll of leavers to established firms</td>
<td>301.71</td>
<td>592.97</td>
<td>0.22 1.00</td>
</tr>
<tr>
<td>3. Cumulative payroll of leavers to spin-outs</td>
<td>36.84</td>
<td>155.50</td>
<td>0.12 0.27 1.00</td>
</tr>
<tr>
<td>4. Cumulative # of emps leaving to established firms</td>
<td>8.13</td>
<td>11.00</td>
<td>0.18 0.87 0.29 1.00</td>
</tr>
<tr>
<td>5. Cumulative # of emps leaving to spin-outs</td>
<td>0.77</td>
<td>1.66</td>
<td>0.09 0.38 0.63 0.47 1.00</td>
</tr>
<tr>
<td>6. Cumulative # of emps leaving to established firms (0-$100k)</td>
<td>7.79</td>
<td>10.21</td>
<td>0.17 0.83 0.28 0.99 0.47 1.00</td>
</tr>
<tr>
<td>7. Cumulative # of emps leaving to established firms ($100k-$300k)</td>
<td>0.33</td>
<td>1.37</td>
<td>0.18 0.77 0.18 0.60 0.22 0.51 1.00</td>
</tr>
<tr>
<td>8. Cumulative # of emps leaving to established firms ($300k-$5M)</td>
<td>0.012</td>
<td>0.136</td>
<td>0.14 0.29 0.10 0.17 0.09 0.14 0.21 1.00</td>
</tr>
<tr>
<td>9. Cumulative # of emps leaving to spin-outs (0-$100k)</td>
<td>0.70</td>
<td>1.47</td>
<td>0.08 0.36 0.54 0.46 0.98 0.47 0.19 0.07 1.00</td>
</tr>
<tr>
<td>10. Cumulative # of emps leaving to spin-outs ($100k-$300k)</td>
<td>0.06</td>
<td>0.35</td>
<td>0.10 0.27 0.56 0.27 0.57 0.26 0.23 0.09 0.40 1.00</td>
</tr>
<tr>
<td>11. Cumulative # of emps leaving to spin-outs ($300k-$5M)</td>
<td>0.002</td>
<td>0.050</td>
<td>0.09 0.10 0.45 0.08 0.26 0.08 0.05 0.08 0.18 0.20 1.00</td>
</tr>
<tr>
<td>12. Average age</td>
<td>38.01</td>
<td>6.87</td>
<td>-0.09 -0.02 -0.13 -0.04 -0.13 -0.05 -0.01 -0.05 0.00 0.00 1.00</td>
</tr>
<tr>
<td>13. Average education</td>
<td>13.85</td>
<td>1.38</td>
<td>0.13 0.03 0.04 0.02 0.04 0.02 0.03 0.03 0.03 0.02 0.33 1.00</td>
</tr>
<tr>
<td>14. Percent white</td>
<td>0.83</td>
<td>0.25</td>
<td>0.00 -0.07 -0.01 -0.09 -0.01 -0.09 -0.05 -0.01 -0.01 0.00 0.00 0.29 0.14 1.00</td>
</tr>
<tr>
<td>15. Percent male</td>
<td>0.30</td>
<td>0.22</td>
<td>0.17 0.09 0.04 0.09 0.04 0.08 0.07 0.03 0.04 0.04 0.03 0.00 0.04 0.04</td>
</tr>
</tbody>
</table>

Note: N = 70 130.
Table 3. Linear probability model on employee mobility

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DV: Mobility</strong> (Coefficients and errors × 10^{-4})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.792***</td>
<td>0.939</td>
</tr>
<tr>
<td>Age$^2$</td>
<td>-0.000993</td>
<td>0.658***</td>
</tr>
<tr>
<td>Years of Education</td>
<td>0.346***</td>
<td>0.582***</td>
</tr>
<tr>
<td>Years of Tenure</td>
<td>-10.9***</td>
<td>7.97***</td>
</tr>
<tr>
<td>Years of Tenure$^2$</td>
<td>4.28**</td>
<td>-0.518 (4.57)</td>
</tr>
<tr>
<td>Tenure &lt; 1 year$^2$</td>
<td>-18.3***</td>
<td>20.1**</td>
</tr>
<tr>
<td>Tenure is Censored?</td>
<td>-8.59***</td>
<td>6.61***</td>
</tr>
<tr>
<td>Male</td>
<td>0.00095***</td>
<td>-0.036***</td>
</tr>
<tr>
<td>Annual Earnings ($1000s)</td>
<td>0.00095***</td>
<td>-0.036***</td>
</tr>
<tr>
<td>Annual Earnings$^2$ ($1,000,000s)</td>
<td>0.00095***</td>
<td>-0.036***</td>
</tr>
<tr>
<td>Constant</td>
<td>150***</td>
<td>80.4***</td>
</tr>
<tr>
<td>N Observations</td>
<td>767 307</td>
<td>73 061</td>
</tr>
<tr>
<td>N Groups</td>
<td>37 775</td>
<td>15 252</td>
</tr>
<tr>
<td>R$^2$</td>
<td>0.0098</td>
<td>0.0200</td>
</tr>
</tbody>
</table>

Note: Models control for race and include firm-year fixed effects. Robust standard errors are in parentheses.

Table 4. Linear probability model on employee mobility: robustness

<table>
<thead>
<tr>
<th>Focal subgroup:</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DV: mobility</strong> (coefficients × 10^{-4})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Panel 1. Earnings &gt; = $100,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual earnings ($1000s)</td>
<td>-0.0315***</td>
<td>0.117***</td>
</tr>
<tr>
<td>Annual earnings$^2$ ($1,000,000s)</td>
<td>0.00295***</td>
<td>-0.0165***</td>
</tr>
<tr>
<td>Panel 2. Years of education &gt; = 16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual earnings ($1000s)</td>
<td>-0.0905***</td>
<td>0.265***</td>
</tr>
<tr>
<td>Annual earnings$^2$ ($1,000,000s)</td>
<td>0.00809***</td>
<td>-0.033***</td>
</tr>
<tr>
<td>Panel 3. Tenure &lt; = 5 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual earnings ($1000s)</td>
<td>-0.125***</td>
<td>0.26***</td>
</tr>
<tr>
<td>Annual earnings$^2$ ($1,000,000s)</td>
<td>0.0115***</td>
<td>-0.0707***</td>
</tr>
<tr>
<td>Panel 4. Within employer wage growth top 25% (in $t - 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual earnings ($1000s)</td>
<td>-0.0715***</td>
<td>0.222***</td>
</tr>
<tr>
<td>Annual earnings$^2$ ($1,000,000s)</td>
<td>0.00708***</td>
<td>-0.0286***</td>
</tr>
<tr>
<td>Panel 5. Within employer wage distribution top 25% (in $t - 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual earnings ($1000s)</td>
<td>-0.067***</td>
<td>0.189***</td>
</tr>
<tr>
<td>Annual earnings$^2$ ($1,000,000s)</td>
<td>0.00624***</td>
<td>-0.0265***</td>
</tr>
<tr>
<td>Panel 6. Age &gt; = 30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual earnings ($1000s)</td>
<td>-0.0999***</td>
<td>0.26***</td>
</tr>
<tr>
<td>Annual earnings$^2$ ($1,000,000s)</td>
<td>0.00942***</td>
<td>-0.0365***</td>
</tr>
<tr>
<td>N observations</td>
<td>767 307</td>
<td>73 061</td>
</tr>
<tr>
<td>N groups</td>
<td>37 775</td>
<td>15 252</td>
</tr>
</tbody>
</table>

Note: Models include all controls from Table 3 including firm-year fixed effects.

DOI: 10.1002/smj
education (Table 4, Panel 2). In both the high earnings sample and the high education sample, the probability of mobility decreases with earnings, while the probability of mobility to a spin-out conditional on mobility increases with earnings. Thus, the results provide consistent support for Hypotheses 1 and 2 even when limiting the analyses to employees who are likely to be attorneys.

Table 5 reports the estimates of the relationship between source firm performance and employee moves to established firms and to spin-outs. The results in Table 5 demonstrate that the impact of exits to spin-outs is significant and negative, and the impact of exits to established firms is not significant. The difference in the two coefficients is strongly statistically significant (at the 0.1% level). These findings support Hypothesis 3. Given the large sample size in the estimates, it is surprising that some coefficients are not significant; this is strong evidence that there is not an economically significant relationship between these explanatory variables and the dependent variable. Specifically, although employee exit to an established firm is not associated with a change in source firm performance, an exit to a spin-out adversely impacts the source firm’s revenue per employee by $269, which translates to a $22,865 loss for an average-sized firm (which is 85 employees).

Table 6 provides results on the relationship between exiting employee ability and source firm performance. The coefficients on the number of employees exiting in each earnings class measure the impact of each type of exit on source firm performance through revenues, after accounting for the replacement of exited workers. For moves to established ventures, exits of employees earning less than $100,000 actually positively impact source firm performance and exits of those in the higher pay classes have no significant impact. We note that given the large sample size in the estimates, non-significant results provide strong evidence that there is not an economically significant
relationship between these explanatory variables and the dependent variable. However, the estimates for employees moving to spin-outs tell a different story. Exits to new ventures of employees who earn less than $100,000 do not have a significant impact on parent firm performance, but exits of those in higher pay classes have a significant and negative impact that increases with pay class. Further, the coefficient differences between employee entrepreneurship and mobility to established firms are strongly statistically significant for the two higher pay classes. Specifically, losing an employee to a spin-out who is represented in the second pay class in Table 6 (average earnings of $147,000) results in a net loss, above and beyond the loss of the employee’s earnings, of $193,015 in revenue in the following year for an average-sized firm relative to a firm without a mobility event to a spin-out. The loss is far greater for an employee exit to spin-out from the highest pay class (average earnings of $481,000): the source firm suffers a net loss in revenue of $1,000,007 dollars relative to a similar firm without a mobility event. These results, which suggest that the adverse impact on firm performance of employee entrepreneurship relative to mobility to established firms increases with the compensation of the exiting employee, support Hypothesis 4.

The effects of the control variables are consistent throughout the firm performance regressions. The average education of its workforce is positively related to a firm’s performance. Gender composition is significantly related to revenue per employee within firms; those with a greater percentage of male employees have more revenue per employee. Occupational differences by gender within law firms likely drive this result. Racial composition is not a significant factor, and average workforce age is not consistently significant.

Additional analysis and robustness checks

Our analysis connects micro- and macro-level analysis by examining the determinants of mobility at the individual-level and connecting these individual decisions with firm-level outcomes. However, alternative micro- and macro-processes may explain our findings. To probe our analyses further, we examine whether our results persist after we account for involuntary turnover, aggregate quality of mobility events and alternative measures of firm performance.

An assumption in our theoretical section is that all mobility decisions are voluntary; however, employee mobility may also be involuntary. Notwithstanding that involuntary exits may be generally related to underlying individual characteristics for value creation, we examine the robustness of our results after accounting for three primary sources of involuntary turnover. First, we control for turnover driven by the up-or-out tournament model of promotion (Rebitzer and Taylor, 2007). Second, we control for turnover preceded by poor performance. Third, we exclude turnover that was likely driven by the temporary nature of internships.

Results of the coefficients of interest are demonstrated in Table 4. In Panels 3–6, the coefficients capture the impact of earnings on individuals’ mobility decisions for the group of individuals that is less likely to be moving involuntarily. Because involuntary exit due to the tournament model typically occurs after six or seven years at a firm, in the first set of coefficients we focus on employees with five or fewer years of tenure at the firm (Panel 3).13 Second, to exclude employees who may have lost their jobs due to poor individual performance, we focus on employees whose wage growth is in the top quartile of similar employees in the prior year (Panel 4) and we focus on employees who are in the top quartile of their employer’s earnings distribution (Panel 5). Third, we control for the mobility of intern who are likely to be young and work for fixed terms, by focusing on employees who are at least 30 years old (Panel 6). In all specifications, the results are consistent with the baseline model. Hypotheses 1 and 2 are supported even when focusing only on employees who are very unlikely to face involuntarily mobility.

At the macro level, we extend the analysis to examine the effect of the aggregate quality of movers on firm performance. Table 7 contains estimates of the impact of the aggregate quality of exiting employees (as measured by the cumulative pre-mobility earnings of all movers) on firm performance. Again, the estimates demonstrate an adverse impact on parent firm performance of

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13 Turnover driven by the up-or-out system is also unlikely to occur for workers with more than seven years tenure. We perform similar analysis focusing only on employees with tenure greater than seven years, and again obtain results consistent with Table 3. Given left-censoring and truncation of the tenure variable at ten years, sample size related disclosure concerns prevent us from reporting the estimates.
employee moves to spin-outs, but moves to established firms do not have a significant effect on source firm performance with the difference in coefficients being strongly statistically significant.

Finally, in unreported regressions, we examine the sensitivity of our results to firm performance measures other than revenue per employee. Because they are the ultimate decision makers in most law firms, partners may seek to maximize revenue per partner instead of revenue per employee. Under the assumption that partners are the highest earners in their firms, we reestimated the results for Hypotheses 3 and 4 using revenue per high-earning employee as our dependent variable, first defining high-earning employees as individuals earning $100,000 or more, and second as individuals earning $300,000 or more. Results are robust to both specifications.

DISCUSSION AND CONCLUSION

We connect micro-level decisions and their macro-level outcomes by examining both the determinants of employee mobility and the effects of that mobility on firm performance. We focus on moves from non-dying firms both to established firms and to spin-outs. Differences in the observable quality of exiting employees, in the importance of appropriating new opportunities and complementary assets, and in the unobservable quality of exiting employees may differentiate the impacts of these two types of mobility. Understanding the relative impacts of employee exits to established firms and employee entrepreneurship on source firm performance provides insights for the strategic management of human capital based on the value of human capital in different contexts, the value of knowledge transfer, and the nature of the creative destruction process.

At the micro-level, we predict and find support for a negative relationship between an employee’s ability to generate value (as proxied by earnings) and mobility (Hypothesis 1). Further, we theorize and show that conditional on mobility, the likelihood of spin-out formation relative to mobility to an established firm increases with earnings (Hypothesis 2). At the macro level, we develop hypotheses relating the effect of both quantity (Hypothesis 3) and quality (Hypothesis 4) of employees exiting to established firms and spin-outs on source firm performance relative to no employee mobility. We find that employee entrepreneurship events have a larger negative effect on parent firm performance than employee moves to established firms (Hypothesis 3), and the difference in the effects of the two types of mobility events is positively related to the exiting employees’ ability to generate value (Hypothesis 4). Importantly, our findings suggest that the larger adverse impact on source firm performance of employee entrepreneurship over mobility to established firms is driven not only by the observable factors of exiting employee quantity and quality. The empirical support for Hypothesis 4 suggests that the (per person) effect of moves to spin-outs relative to moves to established firms increases with observable employee quality. That is, if two observably equivalent employees exit a firm, one to an established firm and one to a spin-out, the source firm is more adversely impacted by the spin-out event; and further, the difference in impact on source firm performance increases with employee quality. This pattern suggests that much of the adverse effect can be attributed to the importance of complementary assets, given that their transfer or recreation is more likely to occur in spin-outs rather than in established firms.
Theoretically and taken together, these results point to fundamental differences in the causes and consequences of employee mobility and employee entrepreneurship: when labor markets among existing firms are unable to correctly assess either the quality of the human capital embodied in employees, or incorporate their nonpecuniary motives, they may choose to venture out on their own. Further, the differential ability to replicate or transfer complementary assets when moving to an established firm relative to moving to a spin-out also relates to the market opportunities that are being exploited. It may be that general opportunities (e.g., better career development, higher compensation) trigger moves to established firms, but specific opportunities (e.g., ability to transfer client accounts or capitalize on underutilized technologies or enter new markets) trigger employee entrepreneurship. The results also highlight that such entrepreneurial decisions are more likely to unleash the Schumpeterian forces of creative destruction (Schumpeter, 1934). Since higher performing employees seem to have more entrepreneurial abilities and aspirations, their loss and the concomitant loss of complementary assets and specific opportunities have a greater detrimental effect on source firm performance.

Finally, it is important to note that in our empirical context, high earnings correlate strongly with age and gender. In particular, most partners in law firms are older males. While law schools have recently made great strides toward gender balance in their student bodies, these trends in the population of law students are not yet represented at the highest levels of law firms. In the current empirical context, the most senior lawyers are drawn from a pool of lawyers who entered the field during a period of substantial gender imbalance. However, in our empirical analysis we control for differences attributable to age and gender of mobile employees, so the effect that is measured is the mobility effect after controlling for the older male effect. One additional correlation is that partners are more likely to stay with their firms, but if they do leave, they are more likely to go to spin-outs. In light of the theoretical construct we develop, this result is not surprising. Partners are more likely to have a bargaining advantage, since the importance of complementary assets to their ability to create value is low, and they are more able to recreate these complementary assets should they move.

Limitations and future research

The limitations to our study also provide avenues for future research. The first relates to generalizability to other contexts. To the extent that legal services’ dominant organizational structure—the partnership model—characterizes most professional services industry contexts, we believe that our theory and empirical evidence will shed light on issues related to strategic human capital management, as well as employee mobility, employee entrepreneurship, and effects on source firm performance in such industries. These firms account for almost half of the U.S. GDP (Bureau of Economic Analysis, 2010) and are a critical component of the knowledge economy. Our work extends on recent work that focuses on explaining the size and structure of firms in this important setting (Levin and Tadelis, 2005; Garicano and Hubbard, 2007; Rebitzer and Taylor, 2007) by identifying an important factor impacting the genesis of firms and the limits to their size and structure: the heightened ability of high quality employees to transfer and recreate relevant complementary assets in entrepreneurial settings. While both professional services and high-technology manufacturing represent knowledge-intensive industries (Teece, 2003), the complementary assets owned by professional service firms may be more susceptible to transfer or replication than those owned by technology-intensive firms, which potentially limits the generalizability of these findings to other knowledge-intensive contexts. As opposed to physical capital or intellectual property protected by patents, the complementary assets in professional services are typically embodied in human assets. The latter are more rivalrous given the potential of team mobility, and the impact of employee mobility and employee entrepreneurship on the performance of a professional services firm may well be more pronounced than its impact on a high-technology firm or in other knowledge-intensive industries. Future research could examine whether our findings pertain in other knowledge-intensive industries and for different organizational structures.

Second, our empirical design treats all individuals as independent mobility events and does not account for team structures. To the extent that employees commonly exit in teams in the legal services industry, we cannot tease out the differential effects of team membership among a collection of
identical independent individuals. To address such concerns in future research, we hope to utilize our unique employer-employee data and examine the impact of the team membership of mobile employees on both source and recipient firm performance.

Importantly, although we theorize and find support for the postulated relationship of employees’ ability to generate value with their ability to transfer or recreate complementary assets on their mobility decisions and the subsequent effect on source firm performance, explicitly testing the effects of transferring or recreating different types of complementary assets is beyond the scope of this study. As discussed above, organizational knowledge, nonhuman, and human complementary assets are all potentially transferable or replicable. Teasing out the differential explanatory power of each type of complementary asset would be an immensely valuable avenue for future research. For instance, both Phillips (2002) and Wezel et al. (2006) have conjectured that in professional services, high-level routines are more easily transferred to start-ups than to existing firms. As a result, employees will be able to replicate more routines more effectively at a new firm than at an established firm, and thus a spin-out will be more similar to its parent than an established firm that receives employees from the same source. Consequently, moves to spin-outs pose a greater competitive challenge than moves to existing firms.

Our study did not explore the role of legal specializations in the mobility decisions of attorneys. Garicano and Hubbard (2007) demonstrate that complementarities between specializations of lawyers play an important role in determining the boundaries of legal service firms. As a consequence, the exit of employees who possess a specialty that complements their employer’s portfolio of human assets will have a larger impact on source firm performance than the exit of employees who do not so complement the practice. In both our individual- and firm-level analyses, we focus on the level of human capital, but the type of human capital and human assets possessed by employee and firm, respectively, could confound our findings. Although data limitations put such an examination beyond the scope of our study, these questions may be fruitful avenues for future research, since they relate to the complementarities between the different types of knowledge embodied in human capital, not just its ordinal level or amount (as proxied by earnings).

Contributions

Our study contributes to the literature streams on the microfoundations of strategic management and the relative impact of employee mobility and entrepreneurship on source firm performance. By examining the mobility and entrepreneurship decisions of individuals and the consequences of these decisions on firms, we add to the microfoundations of strategic management research (Coff, 1997). Specifically, we identify the importance and portability of complementary assets as a key driver of micro-level employee exit decisions. This allows us to ascertain which employees are most likely to have a negative impact on the source firm’s performance when they leave to join another firm. While extant literature has emphasized the relevance of complementary assets for competitive advantage in an interfirn context (Gans and Stern, 2003; Franco et al., 2009; Teese, 1986; Tripsas, 1997), our study highlights their role in an intra-firm context that also has ramifications for inter-firm competition: employees who co-create value can limit the firm’s ability to appropriate it either by extracting higher rents by credibly threatening to leave and replicate complementary assets outside the firm’s boundaries, or by actually doing so and creating new ventures that reduce the firm’s competitive advantage. Importantly, this also implies that typical measures of performance, such as shareholder wealth creation, may under-represent the extent of value creation by a firm.

We also contribute to the body of research on the antecedents and consequences of knowledge spillovers via employee mobility and entrepreneurship. Our findings on the antecedents of knowledge spillovers via entrepreneurship builds on the extensive body of research on what individual traits and qualities are correlated with the decision to become an entrepreneur (Lazear, 2005; Nicolau et al., 2008; Robinson and Sexton, 1994). We add that employees’ ability to replicate or transfer complementary assets is important to their decision to go to a spin-out. By focusing on the ability to transfer complementary assets outside of their employer, we highlight the role of knowledge spillovers through human capital transfer, routine transfer, and opportunity transfer when a firm loses an employee to a new venture.

While there has been significant work done on understanding the impact of knowledge transfer via both employee mobility to existing organizations

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(Agarwal et al., 2009; Almeida and Kogut, 1999; Bhide, 1994; Oettl and Agrawal, 2008; Rosenkopf and Almeida, 2003) and employee entrepreneurship (Agarwal et al., 2004; Franco and Filson, 2006; Hellmann, 2007; Klepper and Sleeper, 2005; Phillips, 2002) on the survival and performance of spin-outs, we add to the few studies (Phillips, 2002; Wezel et al., 2006) that consider the feedback effect on the parent firm. Additionally, our work addresses both the micro-level phenomena of employee mobility and employee entrepreneurship simultaneously rather than in isolation. Further, our finding that knowledge transfer via employee entrepreneurship has a larger adverse effect on firm performance than knowledge transfer via employee mobility supports the Schumpeterian view that the creation of new ventures potentially results in a greater destruction of value at a source firm relative to a mere transfer of the same knowledge from one firm to another.

In doing so, we add to the recent studies of knowledge transfer via employee mobility that have started to tease apart the extent to which recipient organizations are actually ‘learning-by-hiring’ versus enjoying the benefits of knowledge transfer alone (Singh and Agrawal, 2011). To the extent that employee entrepreneurship may indicate not only a transfer of the core and complementary assets but also a greater replication of knowledge, our results suggest that employee entrepreneurship may be a more powerful mechanism of knowledge diffusion from one organization to another.

In terms of managerial implications, the issues highlighted in our study resonate with the recent account of Google’s innovative steps in response to the ‘xoolger’ phenomenon (xoolger, a contraction of ‘ex-Goozger,’ is pronounced ‘zoogler’): employees of Google leaving to join other firms or create start-ups (Fost, 2008). Google’s concern with employee entrepreneurship is not only due to the transfer of their own knowledge and experience but also to employees’ heightened ability to convince colleagues best-suited to their new projects to join them, as well as to access venture funding through the xoolger network (Fost, 2008). The company is developing sophisticated search algorithms to identify those employees most at risk of leaving. Google’s strategy for retaining its human assets is not used ‘across the board’ for all employees, but targeted toward a differential assessment of who feels the most underutilized and who generates the most value (Morrison, 2009). Our study provides managers with the insight that an early identification of employees who are able to convince other employees to leave and replicate networks at new ventures is critical for sustained long-term performance. Further, the most valuable employees appear to be the ones most likely to move to entrepreneurial firms. Our evidence that employee entrepreneurship has a significant negative impact on source firms relative to employee moves to established firms suggests that firms should tailor their micro-level human capital strategies to reduce spin-out generation more than traditional employee mobility. To avoid the loss of those who generate the most value, managers need to identify and assess which employees are most able to replicate or transfer a firm’s complementary assets and then strengthen their incentives to stay, or weaken their ability to replicate the complementary assets.

In summary, the purpose of our study is to answer the questions: who leaves, where to, and why worry? We find that high-earning individuals tend to move less, but if they do move, they tend to start new firms. Controlling for earnings, we find that employee entrepreneurship events are significantly detrimental for source firm performance, while employees who move to existing firms have an insignificant impact. Our findings suggest that the negative impact on the parent persists even after controlling for potential selection of high-ability individuals into start-ups, and the negative impact increases with employee quality. Our study sheds new light on the interaction of parent and spin-out performance, with implications for competitive dynamics and parent firm strategies, because parent firm performance is affected not only by the quality of exiting employees but also by the type of the opportunity they pursue.

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