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High-Performer Mobility to Entrepreneurship and Parent-Firm Performance

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Abstract

We investigate the effect of high-performer employee mobility to same-industry startups on parent-firm performance. High-performer mobility induces a loss of human assets but might also enable competition by transferring human and complementary assets from the parent firm to a competitor. Only when such transfer occurs is mobility to same-industry startups more harmful than other types of high-performer mobility. Human and complementary asset transfer is conditional on the departing high performer's ability to accumulate (and hence transfer) knowledge from the parent firm and the recipient firm's ability to absorb such knowledge. In support of this hypothesis, we show that the high performer's tenure and the startup's resources (size) moderate the performance effect of high-performer mobility on same-industry startups.

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Introduction

It is (almost) a stylized fact that firms founded by former employees at incumbent firms in the same industry, often labelled *spinoffs*, perform better than other startups. However, how does the mobility of high-performing employees to spinoffs affect the subsequent performance of incumbent firms (parent firms)? Industry-level studies have found that high performers' mobility to spinoffs harms the performance of parent firms in various ways (Phillips, 2002; Wezel, Cattani, and Pennings, 2006; McKendrick, Wade, and Jaffee, 2009; Campbell, Ganco, Franco, and Agarwal, 2012). While this is found in multiple studies, we know less about why and when spinoff mobility is detrimental to parent-firm performance and under what circumstances such departures pose a competitive treat. We study whether additional negative performance effects of spinoff mobility, relative to other types of high performer mobility, depend on the spinoff's ability to transfer human and complementary assets from the parent firm to the startup.

We use a unique dataset covering the entire private sector in Denmark to study the effects of high-performer mobility to spinoffs on the survival and sales of 30,911 parent firms from 2000 to 2013. This data source enables us to follow employees across firms for the full period. We define high-performing employees as those ranked in the top 25 percent of wage earners in the parent firm prior to departure. In contrast to previous studies, we control for high-performer mobility in general because our data enable us to see all destinations. Controlling for high-performer mobility allows us to assess the magnitudes of effects stemming from a competitive transfer and re-creation of parent-firm complementary assets versus pure losses of human capital.

We identify and explore three moderators of the competitive transfer and re-creation of assets. First, to transfer human and complementary assets from the parent firm, the high performer must first accumulate knowledge and experience at the parent firm. This prerequisite, we argue, makes tenure at the parent firm a significant moderator. Second, the spinoff's ability to absorb and recreate parent-firm complementary assets depends, among other things, on resources. Thus, spinoff size is a second moderator as a proxy for the amount of resources. Third, depending on the industry in question, geographical distance between the spinoff and parent firm is a third moderator. For example, the transfer of clients and social capital might be difficult across large distances.

Overall, the factors that allow a transfer and re-creation of parent-firm complementary assets

to eventually translate into a loss of competitive advantage by the parent firm vary by industry. Therefore, we further investigate how these effects and moderators differ within selected industries, which we divide into three groups by the following respective characteristics: 1) the transferability of complementary and human assets is low; 2) the market's geographic range varies, and a nearby location is critical; or 3) clients are easily transferred.

We find that additional negative effects on parent-firm performance, following high performers' mobility to spinoffs, are conditional on spinoff size and, in particular, employee tenure. We demonstrate that effects vary by industry. These results contribute to the entrepreneurship and spinoff literature from both a macro- and microeconomic perspective. We explicitly capture the value destruction of parent firms and investigate how much of this loss stems from the loss of human assets versus the competitive transfer of human and complementary assets. This evidence contributes to a macrolevel understanding of creative destruction. Our research also contributes to the strategic human resource management, compensation and retention literature by developing our understanding of knowledge transfer through employee mobility. Our results call into question the extent to which employee mobility enables direct competition. In some settings, spinoff mobility poses little risk of a competitive transfer of parent-firm complementary and human assets or the appropriation of parent-firm value. This result challenges the apparently widespread resistance to spinoff mobility and the distribution of noncompete covenants, which have been shown to decrease interfirm mobility and entry into entrepreneurship (Stuart and Sorenson, 2003; Marx, Strumsky, and Fleming, 2009).

Theoretical framework

In the following sections, we discuss when and why spinoff mobility has adverse impacts on parent-firm performance. First, we argue that high-performer mobility to spinoff entrepreneurship, as well as other types of high-performer mobility, induce a harmful loss of human assets. Second, spinoff mobility might enable competition and value appropriation at the expense of parent firms, further increasing detrimental performance effects. While high-performer mobility by definition induces human asset loss, the latter effect, we argue, is not granted but conditional on 1) the employee's ability to accumulate and transfer human and complementary assets from the parent firm to the

spinoff, 2) the spinoff's ability to absorb and recreate such complementary assets and 3) competition between the parent and spinoff firm for the same customers and resources. We develop testable hypotheses of these mechanisms and suggest three moderators that might condition the competitive effects of spinoff mobility and, hence, additional adverse impacts of spinoff mobility compared to high-performer mobility in general.

High-performer mobility and parent-firm effects

Several theories may explain the potentially harmful effects of high-performer mobility on a parent firm. It is, however, common for many of these theories to frame employees as resources or assets for firms. Campbell et al. (2012) refer to human assets as 'core assets'. Similar to the economic term 'human capital', human assets refer to skills and knowledge as well as personal (noncontractual) relations and social processes (Coff, 1997). Human assets, as opposed to complementary assets, are embodied in individual employees. Therefore, human assets are lost when high-performing employees leave, resulting in adverse impacts on parent firms. From a social network perspective, this decline in the parent firm's stock of human assets might also entail a detrimental loss of social relations. This loss of social capital depletes the parent firm's organizational capabilities and reduces performance (Shaw, Duffy, Johnson, and Lockhart, 2005).

High-performer mobility affects not only external network relationships but also within-firm relationships (Corredoira and Rosenkopf, 2010). The latter implies a loss of instrumental relationships and reduced organizational efficiency (Cao, Maruping, and Takeuchi, 2006). High performers, executives in particular, have a disruptive effect on the internal functioning of the organization as coordinators of activities and knowledge networks, and hence, their departure disrupts organizational routines (Briscoe and Rogan, 2016; Gjerløv-Juel, 2019). When an employee leaves the parent firm, her departure and subsequent replacement might trigger organizational restructuring within the parent firm, potentially destabilizing the organization and resulting in missed opportunities (Hannan and Freeman, 1977; 1984; McKendrick et al., 2009). This result is more likely when the employee is high ranking and when she is more important to the parent firm (McKendrick et al., 2009).

The above arguments suggest that high-performer mobility depletes parent-firm human and social capital stocks and destabilizes organizational routines (Gjerløv-Juel, 2019). This suggests

detrimental effects on parent-firm performance from spinoffs and other types of high-performer mobility. Moreover, because the accumulation of firm-specific knowledge, experience and social capital occurs over time, we expect greater human asset loss when long-tenure employees depart. For similar reasons, the disruption of organizational functioning, including internal routines, processes and social relations, is significant when long-tenure and high-ranked members of the organization leave. These arguments suggest that the detrimental effect of the departure of a high performer increases with her tenure at the parent firm.

Hypothesis 1: *The adverse impact on parent-firm performance from high-performer mobility increases when long-tenure employees leave.*

Recent studies show that employees with more education, higher job performance and higher wages are more likely to enter and succeed at entrepreneurship (Braguinsky, Klepper, and Ohyama, 2012; Groysberg, Nanda, and Prats, 2009; Elfenbein, Hamilton, and Zenger, 2010; Carnahan, Agarwal, and Campbell, 2012). Carnahan et al. (2012) hypothesize that conditional on mobility, high-performing employees are more likely to enter entrepreneurship because entrepreneurship offers a direct link between individual performance and pay, attracting high performers seeking to improve their earnings (Carnahan et al., 2012; Elfenbein et al., 2010). Moreover, Sakakibara and Balasubramanian (2020) show that high performers (individuals from higher wage deciles) are more likely to enter entrepreneurship in the same or related industries rather than industries that are distant from the parent-firm industry. When spinoffs are founded by high performers, their departure might increase the need for organizational restructuring, leading to a decline in parent-firm performance and greater losses of human assets that are costly to replace. However, such effects are not unique to spinoff mobility. Moreover, it is important to recognize that a *loss* of human assets does not necessarily imply a competitive *transfer* of human assets (see, e.g., Briscoe and Rogan (2016)). We discuss this in greater detail below.

Who and where to?

The above arguments suggest that high-performer mobility, on average, reduces parent-firm performance. However, some types of high-performer mobility might be more harmful to parent-firm

performance than other types. Phillips (2002); Wezel et al. (2006); McKendrick et al. (2009); Campbell et al. (2012) find empirical evidence of detrimental effects on parent firms from spinoff mobility. Here, the main explanation is that the adverse impact on parent-firm performance is due to the formation of a competitor and the transfer of human and complementary assets from the parent firm. This transfer allows for spinoffs to appropriate value at the expense of the parent firm, making spinoff entrepreneurship more harmful than other types of high-performer mobility. However, we argue that such additional competitive effects are *conditional* on the high performer's ability to first accumulate and later transfer human and complementary assets from the parent firm.

Building on Teece (1986), Campbell et al. (2012) argue that human assets in combination with complementary assets are essential parts of value creation and appropriation. We adopt the Campbell et al. (2012) view of complementary assets to frame our analysis of why and when high-performer mobility to spinoff entrepreneurship could have an (additional) adverse impact on parent-firm performance. Previous studies have largely applied this theoretical framework to explain how complementary assets affect the appropriation of technological innovations (see, e.g., Tripsas (1997)).

Complementary assets are embodied in the firm and its employees. Complementary assets traditionally refer to the different organizational functions (from manufacturing to marketing) needed to commercialize (technical) innovations (Yeganegi, Laplume, Dass, and Huynh, 2016). While embodied in the firm or groups of employees, complementary assets can survive the mobility of individual high performers. Campbell et al. (2012) categorize complementary assets into organizational knowledge (e.g., intellectual property, codified knowledge embodied in products or routines and processes), nonhuman complementary assets (e.g., brand equity and physical capital such as machines and buildings), and human complementary assets (i.e., tacit and noncodified knowledge such as organizational routines, processes and culture embodied in other employees).

In combination, human and complementary assets are sources of sustainable advantage for a firm, depending on how easily these unique resources are imitated (Coff, 1997). Some assets are tacit, while others are more readily codified. Some assets are contractually governed, while others are not. In fact, contractual assets are exceptions rather than the norm (Teece, 1986), which leaves considerable opportunities for competitive firms to replicate the complementary assets of

the parent firm. High-performer mobility enables the competitive transfer or re-creation of assets, with adverse effects on parent-firm performance as a potential result (Campbell et al., 2012). The complementary assets of incumbent firms are argued to shield them from the creative destruction caused by new entrants by providing a comparative advantage in commercializing technological innovations while impeding imitation (e.g., Teece (1986) and Stieglitz and Heine (2007)). However, complementary assets might not provide protection from entrants that are spawned by the parent firms themselves, i.e., spinoffs.

Studies of spinoffs' success typically argue that founders transfer human and complementary assets from parent firms to spinoffs (Klepper, 2001; Agarwal, Echambadi, Franco, and Sarkar, 2004; Dahl and Sorenson, 2014; Feldman, Ozcan, and Reichstein, 2019). While this enables the latter to outperform other entrants and overcome the liability of newness (Stinchcombe, 1965), it may also increase the spinoff's similarity to the parent firm in terms of products, technologies, markets and strategies. This implies that spinoffs might pose a competitive threat to the parent firm. Intuitively, this threat does not apply equally to all spinoffs. First, the threat relies on the employee's ability to accumulate and transfer parent-firm human and complementary assets to and recreate them within their startup. Campbell et al. (2012) argue that employees with high value-generating abilities (e.g., high performers) are better able to transfer to or recreate within their startup the human and complementary assets of the parent firm. We extend their argument and suggest that this ability is furthermore positively associated with high performers' tenure at the parent firm.

As we explain in a previous section, founders accumulate organizational and firm-specific knowledge at parent firms over time. This firm-specific knowledge could include knowledge about products, production, technologies and organizational practices; it may also include knowledge regarding strategy and markets (Sørensen, 1999; Klepper, 2001; Helfat and Lieberman, 2002; Phillips, 2002; Wezel et al., 2006; Feldman et al. 2019) that might not directly conflict with the intellectual property of parent firms (Cooper, 1985; Roberts, 1991; Shane, 2003). Additionally, such knowledge may include network relationships (Corredoira and Rosenkopf, 2010), for example, when high performers sustain relations with parent-firm customers upon departure.

In sum, we expect that tenure increases (tacit) knowledge accumulation at the parent firm, paving the way for the transfer and re-creation of parent-firm knowledge within the spinoff. In addition, the likelihood of (any employee's) departure is negatively correlated with employee tenure

and the employee's accumulation of firm-specific human capital. That is, the alternative cost of spinoff mobility increases with tenure, suggesting that long-tenured employees will only leave for better startups potentially competing with the parent firm. Because tenure increases the accumulation and eases the transfer of parent-firm complementary assets, we expect additional detrimental effects on parent-firm performance from spinoff mobility by long-tenure high performers.

Hypothesis 2: *The adverse impact on parent-firm performance from high-performer mobility to spinoffs increases when long-tenure employees depart to spinoffs.*

The above arguments suggest that tenure is a prerequisite for experience, knowledge and social capital accumulation at the parent firm. Furthermore, tenure might improve the employee's ability to successfully transfer these complementary assets to the spinoff. However, the ability to then recreate, implement and successfully appropriate parent-firm complementary assets also relies on the recipient firm and its resources.

Complementary assets, by definition, involve synergies between complementary activities such that the total value to the firm exceeds the sum of the individual activities (Stieglitz and Heine, 2007). This idiosyncratic nature of complementary assets suggests that the transfer or replication of single assets might produce less commercial appropriation in a different setting, i.e., at a different firm. In addition, human assets might also be highly firm-specific, involving tacit, complex knowledge and social relationships, which are difficult to imitate (Coff, 1997), although tacit knowledge accumulation does provide spinoffs an advantage over other competitors. Nevertheless, while essential to value creation at the parent firm, high performers' human assets might be less valuable in the absence of the parent firm's complementary assets (Campbell, Kryscynski, and Olson, 2017). Thus, while the loss of human assets from high-performer mobility impedes parent-firm performance, it might not equally enhance the value creation of the spinoff or allow for it to appropriate value at the expense of the parent firm.

Nevertheless, we expect that larger spinoffs with more resources are more likely to have the capacity to absorb and utilize complementary assets obtained from the parent firm. For example, adopting an organizational practice or marketing strategy from the parent firm might only create value when implemented on a larger scale. Similarly, small startups might not have the resources

to commercialize complementary assets that are embedded in or reliant on fixed capital.

One might argue that larger organizations in turn are relatively more inert, suggesting that the implementation of complementary assets might be slow, particularly when it requires organizational changes by the recipient firm. New firms, however, are not yet locked into an organizational structure or specific set of routines. No preexisting patterns restrain them from adapting or replicating parent firms' complementary assets (Wezel et al., 2006; Campbell et al., 2017). Feldman et al. (2019) find empirical evidence that founders transfer a wide range of organizational practices from parent firms to spinoffs. Overlap with parent-firm activities makes the replication of the parent's organizational practices a low-risk, low-search strategy. This strategy could increase the competitive impact of mobility on spinoffs (Wezel et al., 2006; Campbell et al., 2012).

Overall, we expect larger spinoffs to be more capable of absorbing, recreating and appropriating parent-firm complementary assets. We thus hypothesize the following:

Hypothesis 3: *The adverse impact on parent-firm performance of high-performer mobility to spinoffs increases with the spinoff's resources (i.e., size).*

Finally, we acknowledge that the average effects of different types of high-performer mobility, which we propose in the above hypotheses, might vary greatly across industries and contexts. Among other things, the adverse competitive effect depends on the extent to which employee mobility enables competition.

For spinoff mobility to enable competition and spinoffs to appropriate value at the expense of the parent firm, operations must occur in the same market with competition for the same customer base and resources. While spinoffs (by definition) are established in the same industry as the parent firm, they might not be direct competitors. For example, in industries where competition is local, the entry of local, but not distant, spinoffs will cannibalize the parent firm's market. In addition, local mobility is more likely to encourage additional mobility by former coworkers to the spinoff, worsening adverse competition and human asset losses. Overall, we expect the detrimental effects on parent firms of spinoff mobility to increase in proportion to the overlap in products and markets between the parent firm and the spinoff (Phillips, 2002; Wezel et al., 2006). On average, we therefore expect a greater negative effect from mobility to spinoffs that are active in the same

local market as the parent firm.

Hypothesis 4: *The adverse impact on parent-firm performance from high-performer mobility to local spinoffs is greater than that of high-performer mobility to distant spinoffs.*

Finally, we recognize that the adverse impact of spinoff mobility on parent-firm performance and moderators of this effect differ across industries. Among other things, the transferability of human and complementary assets through spinoff mobility depends on the types of assets in question, which vary across industries. The parent firm's geographic range and, hence, reaction to local versus distant mobility is another example of industry variation. We utilize such industry differences to test the above mechanisms in a more direct way, supplementing our empirical study with a series of industry analyses. We introduce these analyses in a later section.

Methods and data

We analyze the effects of spinoffs and other types of high-performer mobility on incumbent firms' performance using linked employer-employee registries from Denmark. These labor market registries (formerly referred to by their Danish acronym, IDA) contain information on all firms and employees from 1980 to 2013 and are maintained by Statistics Denmark. Social security numbers enable the collection of large government registries, which are carefully maintained due to the extensive welfare system, ensuring that all firms and employees can be followed over time.

We follow Elfenbein et al. (2010) and Carnahan et al. (2012) and define **high-performing employees** based on their earnings relative to other employees at the parent firm. Specifically, we define high-performing employees as full-time employees (with a minimum of 30 days of tenure with the parent firm) with a salary equal to or above the 75th percentile of full-time salaries in each firm.[1] An alternative definition would be to follow Campbell et al. (2012), who define high performers as those employees with compensation levels greater than $300,000. However, since

[1]Similarly, Elfenbein et al. (2010) define high- and low-performing employees as the top and bottom 20 percent, respectively, of the firm's pay distribution. We tested the robustness of our results to this definition of high-performing employees using the 90th percentile as a threshold. In addition, we tested a definition of high-performing employees based on their occupational codes: employer, CEO, and top management (following, e.g., Dahl, Dezső, and Ross (2012)). Generally, we confirm our conclusions across these alternative definitions. We comment on the results in a later section. Estimations are available in the Online Appendix.

pay levels can vary greatly across industries, we define high performers in relative terms in our study for all private sector employees. We do not expect the departures of all types of employees to have equal effects on the performance of firms. Blue-collar workers might not have measurable impacts on firms when they resign, and sorting by lower-level workers might even increase firm performance (Carnahan et al., 2012). Lower-level workers are more easily replaced and are unlikely to be unique holders of firm-specific knowledge. As we argue in a previous section, we thus expect high performers to better accumulate and transfer parent-firm human and complementary assets. Along these lines, Campbell et al. (2012) find that the mobility of lower-income employees to spinoffs and rival incumbent firms has either no impact or a positive impact on parent-firm performance.

For our **sample** of incumbent firms, we start with the population of firms in the private sector from 2000 to 2013. Organizations in the public sector, nonprofits, and foundations are excluded since other factors affect firm performance in those sectors. The firm registry, which we rely on for information on entry year and for annual firm data, only includes firms that meet an industry-specific minimum requirement for either sales or employment, i.e., 0.5 full-time-equivalent employees. This requirement automatically excludes inactive firms. If a firm does not appear in the firm database for two consecutive years, we consider the firm closed. We allow for a single year with low activity. We do not allow for reentry. Subsequent observations are dropped, providing a conservative dataset of 591,565 incumbent firms for the analyses. The number of reentering firms that are at risk of being excluded is so small that they are essentially irrelevant here. The literature on spinoffs focuses on larger firms, which exceed these minimum requirements. Excluding inactive microfirms does not lead to selection bias because firms without full-time employees do not allow for meaningful comparison of different types of high-performer mobility.

Parent firms are incumbent firms that lose one or more high performers during the period under investigation. The argument above implies that only high-performing employees can affect parent-firm performance with their departure. In smaller firms, however, all employees might cause such effects, independent of their salary and rank. While the latter is an interesting question for small firms, it is not the objective of our study. Parent firms are, therefore, restricted to those that employ a minimum of 10 full-time-equivalent employees at the time of employee resignation. To ensure that firms in the dataset are comparable, we only include firms with at least 10 full-time-equivalent employees in at least one in two years from 2000 to 2013, reducing our sample to 32,753

firms. Finally, in our models, we exclude observations from 2013, as we cannot identify whether any firms observed in this year subsequently exited (i.e., the firms are not observed in 2014 and 2015). This method leaves us with a final sample of 30,911 firms.

To assess the competitive, detrimental performance effects of spinoffs and the moderators of such effects, we control for the general mobility of high-performing employees. This control allows us to approximately separate the effects emerging from additional competition versus those emerging from human capital depletion.[2] A **spinoff entrepreneur** is a founder of a new business in an industry closely related to the industry of the parent firm, i.e., one with the same four-digit SIC code (Dahl and Sorenson, 2014). We use the firm database to identify startups and obtain information on the entry year. The entry year is the year following departure from the parent firm. We use the firm database to identify startups and obtain information on the entry year. We do not allow for reentry.[3] For startups with fewer than 20 employees at entry, we define the founder(s) as all employees in the first year. This definition follows, for example, Burton, Dahl, and Sorenson (2018), who define all first-year employees as members of the founding team. If there are more than 20 employees in the startup year, we use Statistics Denmark's information on individual occupation to identify all founders.

Estimation methodology

We use two performance measures, *firm survival* and *sales (logged)*, to study the effects of high-performer mobility on parent-firm performance. We estimate the effect on parent-firm survival using an exponential survival model in accelerated failure time (AFT) form.[4] One advantage of AFT is its intuitive interpretation, with estimates predicting how high-performer mobility affects parent firms' expected time to failure. In other words, we estimate *time to failure (t_i)* by assuming that the baseline hazard, $\tau_i = e^{(-\beta_1 x_{1i,t} + \ldots + \beta_k x_{ki,t})t_i}$, follows an exponential distribution (Cleves,

[2] In the Online Appendix, we additionally compare the performance effects of mobility to spinoffs to four different types of high-performer mobility, including nonrival entrepreneurship and rival incumbent firms.

[3] A few startups reappear in the firm database with the same identification number but a different entry year. We drop these subsequent observations from the dataset.

[4] To test the robustness of our results to various model specifications, we also estimated a Gompertz survival model, a Weibull survival model, and a probit model. We comment on these estimation results in a later section.

Gould, and Gutierrez, 2004):

$$ln(t_i) = \beta_1 x_{1i,t} + ... + \beta_k x_{ki,t} + \epsilon_{i,t} \quad (1)$$

For *sales (logged)*, we estimate firm fixed effects models with clustered standard errors. Because of survival bias in our estimations of parent sales, we report these models as an additional performance measure, while we rely on and emphasize the survival analysis for testing our hypotheses. We discuss the implications of survival bias and the lack of an appropriate instrumental variable in a later section.

Variables

In line with Campbell et al. (2012), we investigate lagged departures at *t-1*. We count the number of high-performing employees who depart to become spinoff entrepreneurs in the following year. We calculate the share of high-performing employees who depart to spinoff entrepreneurship relative to the total number of high-performing employees in each firm. Similarly, we control for high-performer mobility in general, which we calculate as the share of high-performing employees who depart relative to the total number of high-performing employees in each firm.

We expect a negative effect on performance captured by our lagged high-performance departure ratio. We hypothesize that this adverse impact increases when long-tenure employees depart. Moreover, we hypothesize that an additional adverse impact of spinoff mobility is conditional on the departing high performer's tenure at the parent firm and the spinoff's size. **Tenure** is the average tenure at the parent firm (years, logged). **Spinoff size** is the number of full-time employees (logged) in the spinoff at entry. If high performers depart to more than one spinoff, size is the average of those firms. To account for the dispersion within this group, we control for the standard deviation of tenure and size (both logged).

We hypothesize an adverse impact of local versus distant spinoff mobility. We define **local mobility** as mobility to a spinoff within 100 km of the parent firm. **Distant mobility** is mobility to a spinoff that is located more than 100 km from the parent firm.[5] We only observe the municipalities where firms are located, not their exact addresses. Therefore, we measure the distance between

[5] As a robustness test, we also estimate our models in Table 4 using 50 km as the cutoff point. Our results are robust to this change. Estimations are available in the Online Appendix.

two firms as the distance between their respective municipalities. We measure the distance from the center of the municipality. If two firms are located in the same municipality, the distance is zero. This approach is similar to that of Dahl and Sorenson (2009). Denmark is a geographically small country that historically had 271 municipalities.[6] These municipalities are similar in size to U.S. counties or parishes, covering an average of 156 km^2 each (Dahl and Sorenson, 2009). It is unlikely that neighboring municipalities are farther than 100 km apart (from center to center); thus, mobility between parents and spinoffs in neighboring municipalities is unlikely to be categorized as distant.

The above covariates focus on high performers who depart for spinoffs. In addition, we include controls for all high-performing employees' characteristics. We divide these controls into two categories, high-performing *leavers* and *non-leavers*. 'Non-leavers' are high-performing employees who continue to work at the parent firm in the following year. 'Leavers' include high performers who do not work for the parent the following year. High-performer characteristics include tenure (years, logged), age (years), age squared, education (years), males (pct.), and position (top management, white-collar and blue-collar, pct.). These variables are averages of high-performing leavers and non-leavers. Other parent-firm controls include firm size (full-time equivalent employees, logged), legal form (dummy for unlimited liability), wage level (the average gross wage level of top managers and white-collar and blue-collar workers (all logged))[7], industries (11 dummies), year dummies, and labor-market regions (12 dummies). In addition, models of parent-firm sales control for parent-firm age (years, logged).

— Insert Table 1 here —

Table 1 provides descriptive statistics for the entire sample of 30,911 unique incumbent firms. Our dataset includes 397,450 high-performer departures, including 8,299 departures to spinoffs. On average, firms experience 1.65 departures each year, corresponding to an average high-performer departure ratio of 13.22 percent. In the Online Appendix, we present a correlation table and provide kernel density plots of the distribution of high-performer departure ratios.

[6] At present, there are only 98 municipalities in Denmark. The number was reduced following a reform in 2007. We use the historical 271 municipalities for a finer-grained analysis.

[7] Real wages are obtained using the GDP deflator with 2010 as the index year. Missing values (not all firms have employees in all categories) were replaced with the industry average.

Results

We start by testing the baseline effect of high performers' mobility on parent-firm performance (mobility to all destinations), which has been found in existing studies. We test this on both dependent variables, survival and sales, in Table 2. However, as we explain in the methods section, we rely on survival analyses for hypothesis testing and include sales as a robustness check.

In Model 1, we investigate the impact on parent-firm survival from high performers' mobility (to all destinations), controlling for parent-firm industry, region, and year. In Model 2, we include all parent-firm controls (we report the full models with control variables in the Online Appendix). Both models confirm that high-performer mobility in general reduces parent-firm survival. In the fully controlled Model 2, we find that a one-percentage-point increase in the high-performer departure ratio decreases the expected time to failure by 1.98 percent ($p = 0.000$). A one-standard-deviation increase in this ratio reduces parent-firm survival by 49.56 percent.[8] For sales, we estimate fixed effects models of parent-firm sales (logged) in Models 3 and 4, Table 2. The two regressions (with and without controls) confirm a negative effect on parent-firm sales from high-performer mobility independent of the destination.

— Insert Table 2 here —

Our first hypothesis suggests that detrimental effects on parent-firm performance increase when long-tenure employees leave. We confirm this for survival in Model 5, where we find that an increase in the departing high performers' tenure by one percent decreases the expected time to failure by 6.39 percent ($p = 0.000$). However, when we estimate the effect on parent-firm sales (see Model 4), we find a positive effect of mobility among long-tenure high performers on parent-firm sales.[9] We suspect that selection bias might influence this result, as high-performer mobility by long-tenure employees significantly reduces the likelihood of selection and hence survival (Model 5). We investigate this explanation below.

[8] We calculate these effects as $(exp(-0.020) - 1)$ and $((exp(-0.020) - 1) * 25.03)$, respectively.
[9] This result is robust to a Heckman selection model correcting for survival bias.

High performer's tenure and spinoff size

In general, we find that high-performer mobility to spinoffs has negative effects on the parent firm in terms of both survival and sales when we compare and control for mobility to different destinations (see Tables 2 and 3 in the Online Appendix). In Hypothesis 2, we suggest that the competitive effects from high-performer mobility to spinoffs are conditional on employees' tenure at the parent firm. The longer they have been employed at the parent, the larger the competitive threat and human capital loss they will represent. We investigate this in Model 6, Table 3. We find that a one-percent increase in high-performer mobility (independent of the destination) reduces parent-firm survival by 1.98 percent. However, this adverse impact significantly increases if this mobility includes the departure(s) of (on average) long-tenure employees to spinoffs. A one-percent increase in high-performing employees' tenure decreases the expected time to failure by 13.15 percent.[10] We include the standard deviation of spinoff tenure (logged) to control for the dispersion within this group. Including this control does not alter the above result. Thus, when re-estimating Model 6 without this control, a one-percent increase in spinoff tenure reduces parent-firm survival by 12.01 percent (estimation available in the Online Appendix). These results strongly support Hypothesis 2, suggesting that significant effects of spinoff mobility on parent firms are conditional on the high performer's tenure at the parent firm. If we investigate this hypothesis on sales as a measure of performance, we see an insignificant effect of tenure on sales (in Model 7, Table 3).

— Insert Table 3 here —

While a competitive transfer of parent-firm complementary assets might rely on human capital accumulation at the parent firm and, hence, tenure, it might also rely on the recipient firm's ability to absorb those complementary assets. If the latter ability is low, the mobility of long-tenure employees might only result in a further depletion of the parent firm's human asset stock, not in more competition. On the other hand, larger spinoffs might be more able to absorb these human assets, as we argue in Hypothesis 3. In Model 8, Table 3, we estimate the effect of the spinoff firm's size on parent-firm survival while controlling for dispersion (the standard deviation of spinoff size, logged). Supporting Hypothesis 3, we find that a one-percent increase in spinoff size reduces

[10] As a robustness test, we also estimate Model 6 using a dummy variable for high performers' tenure. This variable takes the value of one if the average tenure of high performers departing for spinoffs is higher than the 75th percentile of high performers' tenure at the parent firm. This variable shows a similar size effect.

parent-firm survival by an additional 5.54 percent.[11] If we test this effect on sales (Model 9, Table 3), we find that spinoff size increases and conditions the negative effects on parent-firm performance from spinoff mobility, further supporting Hypothesis 3.

As we argue above, a potential interdependence between spinoff size and high performers' tenure might affect the above estimates. Therefore, Model 10 estimates the effects of the spinoff firm's size on parent-firm survival while controlling for high performers' tenure. This joint model partly confirms the above results, showing an additional negative survival effect of long tenure; however, the effect of spinoff size is insignificant. We suspect that this is the result of a positive correlation between employee tenure and spinoff size, with long-tenured employees founding larger and more competitive startups.

In Model 11, we test the effect of spinoff size on parent sales while controlling for tenure. This model confirms that spinoff size increases and conditions the negative effect on parent-firm sales from spinoff mobility. Long tenure, on the other hand, does not impose additional detrimental effects, and we see a positive effect of tenure on parent sales when we control for spinoff size (Model 11). This finding contradicts Hypothesis 2. We suspect that this result is related to selection bias, which we discuss in the following section.

In the above models, we implicitly assume that all departures are voluntary. As a proxy for voluntary departures, we control for the difference between wages at the parent firm and the recipient firm. Decreasing wages might indicate layoffs. However, this control (not reported) is insignificant in all models in Tables 2 and 3. Furthermore, it did not alter the regression estimates. Therefore, we do not include this control in the above or following regressions.

In sum, on the basis of our survival analysis, we confirm Hypothesis 1 that the adverse impact on parent-firm performance from high-performer mobility increases with employee tenure. Furthermore, we confirm Hypothesis 2 by showing that employee tenure increases the detrimental survival effect of spinoff mobility. Finally, we find that spinoff size increases the negative survival effect of spinoff mobility, but this effect is dominated by employee tenure and disappears in the joint model. Thus, the latter result only partly supports Hypothesis 3. Testing our results' robustness to estimations of parent-firm sales, we only find support for Hypothesis 3 that detrimental effects

[11] We find a similar effect when we do not control for dispersion in size. Thus, when re-estimating Model 5 but excluding this control, spinoff size reduces parent-firm survival by an additional 5.92 percent. We report estimations without dispersion controls in the Online Appendix.

on parent-firm performance are conditional on spinoff size.

Selection

Our estimations of parent-firm sales may be subject to selection bias, as some firms exit the population. In particular, we cannot observe exiting firms that would have been among the lowest-performing firms in the population and that may have exited due to the mobility of long-tenure employees to spinoffs. We suspect that this selection might influence the above estimations of parent-firm sales. Selection-corrected models may control for this potential selection bias. In our sample, the likelihood of observing a given firm in the sample is equivalent to the likelihood of that firm surviving. In view of the strategy in Hall (1987), sales growth might be an appropriate instrument, and we re-estimate Model 11, Table 3, using a Heckman selection model with sales growth as an instrument. However, testing the validity of this variable reveals violation of the selection model's assumptions.[12] Therefore, we urge caution in interpreting both selection-corrected and uncorrected models of parent sales. While we report these models as a robustness test, we rely on and emphasize the survival analysis for testing our hypotheses.

The selection-corrected estimation of parent-firm sales (Model 12) supports the above findings that spinoff size conditions the competitive transfer of parent-firm complementary assets to the spinoff. This result lends further support to Hypothesis 3. On the other hand, the selection-corrected model confirms a positive effect of tenure on parent sales (Model 12), thus contradicting Hypothesis 2. However, the selection model (not reported) does confirm the result of the survival analysis that spinoff mobility by long-tenure employees significantly reduces the likelihood of selection and hence survival. Finally, note that we expect positive selection bias because selection is associated with higher performance. This potential positive selection bias suggests that high-performer mobility (to all types of destinations) could be even more harmful to parent-firm sales than our models predict.

[12] While this variable is significant in explaining selection ($p = 0.000$), it is also significant in the sales model ($p = 0.000$). The latter indicates that this instrument is correlated with the error term in the explanatory equation, potentially resulting in inconsistent estimates of the selection models.

Local and distant mobility

To test Hypothesis 4, we first compare the estimates of high-performer mobility to local and distant spinoffs on parent-firm survival while controlling for the general mobility of high performers (Model 13, Table 4). Local mobility is departure to a spinoff within 100 km of the parent firm, and distant mobility is departure to a spinoff farther than 100 km from the parent firm. We do not find significant effects on parent-firm survival from spinoffs' proximity to the parent firm and, hence, no support for Hypothesis 4. We find a similar result for parent-firm sales (Model 14, Table 4).

— Insert Table 4 here —

In Model 15, we estimate the effect of local and distant spinoffs on parent-firm survival, controlling for their tenure and spinoff size as well as the general mobility of high performers. While the estimates of spinoff size and employee tenure at the parent firm are robust and similar in size to what we find in Model 10, the additional survival effect of mobility to local spinoffs differs from Model 13. When we control for spinoff size and employee tenure, high-performer mobility to local spinoffs is less harmful than high-performer mobility in general. While this result rejects Hypothesis 4, it underlines that employee tenure conditions the detrimental effects of spinoff mobility on parent firms.

In Models 16 and 17, we estimate the effect of local and distant spinoff mobility on parent-firm sales while controlling for the general mobility of high performers as well as employee tenure and spinoff size. Model 17 is the selection-corrected model. In support of Hypothesis 4 but contrasting the survival analysis, Model 17 (Table 4) finds that only *local* spinoff mobility increases the negative sales effect, while distant mobility to spinoffs is no more detrimental than average high-performer mobility.

In conclusion, we find evidence that parent-firm tenure and, to a lesser extent, recipient-firm size are important for the transfer of complementary and human assets from the parent firm to the spinoff and for the spinoff's appropriation of parent-firm value creation. In particular, employee tenure conditions the negative survival effect of spinoff mobility. This result is robust across alternative model specifications and variable definitions.[13] Finally, our evidence suggests that close

[13]To test the robustness of our results to different model specifications, we re-estimated Model 15 in Table 4 using a Gompertz survival model, a Weibull survival model, and a probit model. These alternative specifications confirm

proximity to the parent firm could, in some settings, be a significant variable for the spinoff's transfer and utilization of human and complementary assets from the parent firm but irrelevant in others. We explore this and the other mechanism in greater detail in the following section.

Industry analyses

Our hypotheses suggest that an adverse impact on parent-firm performance from spinoff mobility depends, among other things, on the transferability and value appropriation of parent-firm human and complementary assets. We utilize industry differences along these two dimensions to provide a more direct test of what drives the adverse impact on parent-firm performance. We test our hypotheses separately for three industry categories: the manufacturing industry, locally competitive industries and client-based industries.

Manufacturing industry. Not all human and complementary assets are easily transferred and thus at real risk of appropriation by spinoffs. For example, this risk might not exist in industries where value creation is largely the result of nonhuman capital assets (such as physical capital) that are either nontransferable or only available to market entrants at a high cost. Manufacturing is an example of an industry that is expected to rely more on nonhuman tangible assets such as production machinery. This argument suggests a less competitive impact from mobility to small and perhaps new firms, in which financial capital for the re-creation of such complementary assets is likely not available. Manufacturing might therefore provide an example of an industry where the transferability of complementary assets might be low and conditional on the spinoff's size.

— Insert Table 5 here —

that employee tenure conditions an adverse impact of high-performer mobility to spinoff ($p = 0.000$ in all models). In addition, the Weibull survival model and the probit model of parent-firm exit find that spinoff size also conditions the adverse impact on parent-firm survival, thus supporting Hypothesis 3. The Weibull survival model finds that a one-percent increase in spinoff size reduces parent-firm survival by 3.33 percent. *Ln(spinoff size)* is significant at $p = 0.019$ and $p = 0.000$ for the Weibull and probit models, respectively. Finally, we find that mobility to local spinoffs has a positive effect on survival in the Gompertz survival model and the probit model (significant at $p = 0.001$ and $p = 0.036$, respectively), while it is insignificant in the Weibull survival model. We further tested the robustness of our results to alternative definitions of high-performing employees. Thus, we estimated the survival models in Tables 2, 3 and 4 using the 90th rather than 75th wage percentile as a threshold. In addition, we tested a definition of high-performing employees based on their occupational codes: employer, CEO, and top management. We report the estimations in the Online Appendix. For both definitions, we confirm a negative effect of high-performer mobility that increases with employee tenure. Moreover, we confirm that an additional negative survival effect of mobility to spinoff is conditional on employee tenure. On the other hand, spinoff size is insignificant for one definition, while spinoff size has a positive survival effect for the other.

Table 5 estimates the effects on parent-firm survival and sales from high-performer mobility in manufacturing. Confirming our expectation, we find a negative effect on parent-firm survival from high-performer mobility in general but no additional effect from spinoff mobility (Model 18). Somewhat in contrast to our expectations, we find that an additional adverse impact of spinoff mobility in manufacturing is conditional on employee tenure but not spinoff size. Thus, comparable to the full population estimation of Model 15, Model 23 finds that an increase in employee tenure of one percent reduces parent-firm survival by 9.97 percent. This result underlines the significance of employee tenure, as tenure also conditions the survival effect of high-performer mobility to spinoffs in industries where the transferability of complementary assets is presumably low.

For the parent-sales estimations (Models 24 to 29, Table 5), we do find that additional negative effects from spinoff mobility are conditional on the spinoff's size. In the selection-corrected model of parent sales (Model 29), a one-percent increase in spinoff startup size reduces parent-firm sales in the following year by 0.19 percent.[14] This is more than twice the effect found in the full population estimation (Model 17). As with the survival analysis, close proximity to the parent firm does not affect the impact of spinoff mobility on parent-firm sales in manufacturing.

Overall, our analyses of the manufacturing industry reflect our previous results. This result suggests that a competitive transfer of complementary assets from the parent firm to the spinoff through employee mobility is also feasible in this industry setting. Moreover, we find that additional effects of spinoff mobility are conditional on employee tenure. Compared to the full population estimation (Model 17), spinoff startup size plays a greater role in parent-firm sales within the manufacturing industry (Model 29). One explanation for this finding is that complementary, tangible assets are particularly important within the manufacturing industry and necessary for appropriating complementary assets from the parent firm. However, this result is only evident in the sales estimations.

Locally competitive industries. Even in industries where complementary assets are easily transferred or recreated, spinoff mobility might not always enable competition. As we argued in a previous section, this competitive effect requires, among other things, competing in the same market over the same customers and resources. In industries such as the hotel, restaurant, retail,

[14]For the average parent firm in manufacturing (with high-performer mobility), this corresponds to a reduction in sales of approximately 80,000 USD (2010 prices).

and some services industries (for example, hairdressers or auto mechanics), the geographic reach of the parent firm is limited. When a nearby location is critical for generating competitive effects, we should expect a greater effect of mobility to local than to distant spinoffs, all else being equal, provided that this effect is driven by increased competition.

— Insert Table 6 here —

Table 6 estimates the effects on parent-firm survival and sales from high-performer mobility in industries characterized by competition that is primarily local, which we call 'locally competitive industries'. For these industries, the adverse impacts on parent-firm survival from high-performer mobility to spinoffs are largely comparable to the estimates from the full sample. Thus, for parent firms in locally competitive industries, long employee tenure and startup size condition the effect of spinoff mobility on parent-firm survival. In locally competitive industries, a one-percentage-point increase in the total high-performer departure ratio reduces parent-firm survival by 1.98 percent. However, when employee tenure increases by one percent, a high performer's departure to a spinoff reduces parent-firm survival by an additional 13.32 percent (Model 35, Table 6). In addition, Model 32 finds that spinoff size conditions the negative survival effect of high-performer mobility to spinoffs. However, as was the case for the full sample, this effect disappears when we control for employee tenure and location.

Similar to our full-sample estimation, but in contrast to our expectations for these types of industries, spinoffs with close proximity to the parent firm are less harmful than distant spinoffs when we control for spinoff size and employee tenure. This result might reflect agglomeration effects. For example, both new and incumbent firms benefit from the concentration of economic activities in cities and densely populated regions. Overall, our survival analysis for locally competitive industries mirrors the results for the full sample. We thus find that the competitive effects of spinoffs are conditional on the high performer's tenure at the parent firm and, to a lesser extent, the spinoff's startup size.

For the selection-corrected estimation of parent-firm sales (Model 41, Table 6), we do find a greater effect of mobility to local than to distant spinoffs, thus supporting our expectations for this industry. While this result mirrors the results of the full sample (Model 17, Table 4), the size effect increases for locally competitive industries. Thus, a one-percent and one-standard

deviation increase in the high-performer departure ratio to local spinoffs reduces parent-firm sales by 0.004 and 0.04 percent, respectively, approximately twice the effect found in the full sample. Moreover, Model 41 finds no effects of spinoff size or employee tenure, suggesting that only location conditions an additional detrimental effect on parent-firm sales from high-performer mobility to spinoffs. This result suggests that our previous finding (Model 17, Table 4) that location conditions the detrimental effect of high performers' mobility on parent-firm sales was driven by spinoffs and parents in these industries.

Client-based industries. For some parent firms, the loss of social relations may help explain the adverse impact of spinoff mobility. These network effects, however, do not apply equally to all industries. We expect that such effects are especially strong within certain consultancy industries, for example, accounting firms (studied by Wezel et al. (2006)) or law firms (as studied by Phillips (2002) and Campbell et al. (2012)). These are industries in which decisions about business relations are more closely related to particular individuals than to whole companies. Therefore, we expect a greater impact of spinoff mobility in client-based industries, such as law and accounting, where (local) mobility to spinoffs, particularly by long-tenure employees, might involve the direct transfer of clients and business relationships from the parent firm.

— Insert Table 7 here —

For client-based industries, our estimation of parent-firm survival (Model 47, Table 7) reveals that a one-percent increase in the general high-performer departure ratio decreases the expected time to failure by 2.18 percent. On average, spinoff mobility is not more harmful to parent-firm survival than high-performer mobility in general (Model 42). Moreover, we do not find additional and significant effects related to spinoff size, while close proximity to the parent firm apparently reduces the adverse impact (Model 47). However, when a long-tenure employee departs to a spinoff, this reduces parent-firm survival by an additional 22.28 percent. This is approximately twice the effect found in the full sample. For the selection-corrected estimation of parent-firm sales (Model 53, Table 7), we do not find additional or conditional effects of spinoff mobility compared to high-performer mobility in general.

Overall, we show that high performers' tenure is an important moderator of the effects of spinoff mobility on parent survival in client-based industries. Over time, high performers accumulate

firm-specific social capital at the parent firm. This accumulation, we argue, might allow high performers to transfer clients to the spinoff, thus appropriating value at the expense of the parent firm. Interestingly, this result suggests that employee tenure is more important for spurring this transfer than location is.

In sum, while effect sizes differ across industries, our results unanimously indicate that employee tenure conditions an additional negative survival effect from spinoff mobility. This result holds for the full sample and in different industry settings. In addition, we demonstrate that this result is robust to different model and variable specifications. In the following section, we further demonstrate that this result is robust to a battery of robustness tests.

Additional analyses and robustness checks

First, we present kernel density plots for high-performer departure ratios in the Online Appendix, Figures 1 to 6. While these plots do not reveal major concerns with distribution skewness, we test the robustness of our results to distribution skewness. To ensure that our results are not driven by a few parent firms with large departure ratios, we dropped all observations of parent firms with departure ratios >60 percent and re-estimated Models 15, 16, and 17 from Table 4. We report regression results in the Online Appendix. In our re-estimation of Model 15, we find that *both* spinoff size and employee tenure condition the adverse impact on parent-firm survival from high-performer mobility to spinoffs. This suggests that our previous finding with employee tenure dominating the effect of spinoff size might be driven by a subsample of firms with very high departure ratios. Moreover, the size effects of both variables are larger for this subsample of parent firms. For parent firms' sales, however, the results are not robust to this test. While re-estimation for this subsample confirms a negative impact on parent-firm sales from high-performer mobility in general, we do not find that additional effects of mobility to spinoffs are conditional on tenure or size. We only confirm a negative effect of close proximity, but the significance is weak.

Second, in our analyses, we apply aggregate measures of high performers' characteristics. Hence, we potentially impose aggregation errors for this group. First, we account for this in the above analyses by controlling for the dispersion of departing high performers' tenure and spinoff size. Second, in the Online Appendix, we re-estimate the models of Table 3 and Table 4 for a subsample of smaller parent firms with only one or no departures of high-performing employees per year. This

leaves a sample of 9,640 parent firms. Estimations of parent-firm survival generally confirm the results of Table 3 and Table 4. Thus, we find that employee tenure and spinoff size condition the negative effect of high-performer mobility to spinoffs on parent-firm survival. Moreover, in line with the full-sample estimation (Model 15, Table 4), spinoff size is insignificant when controlling for employee tenure. Estimations of parent-firm sales suggest that within this subsample of parent firms, close proximity to the parent moderates the effect of spinoffs on parent-firm sales. However, in the selection-corrected model of parent-firm sales, this and other moderators are insignificant.

Third, we suspect that the impact of high-performer mobility, especially the moderating effects of spinoff size, is more significant in small parent firms. This suggests that our results might be driven by smaller parent firms. To test this expectation, we re-estimate Table 3 and Table 4 in split-sample regressions of small and large parent firms. Small parents are incumbent firms that employ fewer than 50 employees in most years of the observation period. Large parent firms employ 50 or more employees in most years. We present the results in the Online Appendix.

Contrary to our expectations, the survival analysis finds that our hypotheses and full-sample results better apply to the sample of larger than smaller parent firms. Thus, we find that employee tenure moderates the effect on parent-firm survival from high-performer mobility to spinoffs in both samples. However, only the large-parent estimations support the hypothesis that spinoff size conditions the negative effect of high-performer mobility on spinoffs. For parent-firm sales, on the other hand, we find that it is the smaller parent firms that best resemble the full-sample results. For larger parent firms, we confirm a negative effect on parent-firm sales from high-performer mobility. However, we do not find that employee tenure, spinoff size, or location condition this effect.

Fourth, our results illustrate a negative effect of high performers' mobility. An alternative explanation for this finding is that parent firms differ from other firms. For example, it might be that these employees leave declining firms or firms with dark futures, a phenomenon coined *the sinking-ship hypothesis*. For spinoffs, however, this hypothesis runs against the evidence in the majority of the literature, which typically finds that the most successful parent firms also have the largest numbers of spinoffs (Klepper, 2007; McKendrick et al., 2009). Employees at successful firms are more exposed to unexploited (or underexploited) opportunities (Agarwal et al., 2004), and working at a successful firm might be a stamp of approval that enables spinoff entrepreneurs to raise capital and attract the most talented employees (Dahl and Reichstein, 2007; Dahl and

Klepper, 2015). Franco and Filson (2006) even suggest that potential entrepreneurs might accept lower wages for *apprenticeships* at successful parent firms, pointing to a larger number of spinoffs from firms with higher growth rates in past years.

To test this hypothesis, we estimate negative binomial regressions for the number of high-performing employees departing in general and to spinoffs (estimations are available in the Online Appendix). We estimate two sets of models. First, we control for parent-firm employment growth in the past year and then three years before the departure of high-performing employees. Controlling for other parent-firm characteristics, we find that growing firms experience more mobility of high-performing employees to spinoffs. For example, a one-standard-deviation (40.09) increase in employment growth one year prior to employee departure increases the number of high-performing employees departing to spinoffs by 0.07 ($p = 0.011$) and 0.10 ($p = 0.016$), respectively. For employee mobility in general, the results are inconclusive.

Discussion

It is clear that the effects that we observe in this study are the net effects of a complex process whereby parent firms likely have some, although not a perfect, indication of the net loss. Thus, we cannot (and do not intend to) capture the effects of potential mobility that is not taking place because parent firms avert departures through additional wage increases, promotions, etc. However, asymmetric information between parent firms and employee entrepreneurs may hamper such efforts by the parent firm to prevent spinoff mobility. The employee has better information than the parent regarding, e.g., similarities in products and strategies; hence, the parent firm cannot predict how a spinoff will affect competition. Moreover, a new firm has a higher exit risk than incumbent firms, increasing the difficulty of assessing this threat and, hence, the net value loss from departures to new firms. Moreover, Nielsen (2014) shows that entrepreneurs are motivated by intrinsic work values rather than extrinsic values. Thus, a higher income from the parent firm might be less attractive than the autonomy offered by entrepreneurship.

While we show negative net effects of high-performer mobility, the departure of high-performing employees might also have positive effects on parent firms. Tan and Rider (2017) suggest that it might send a positive signal to the labor market that the parent firm is a stepping stone to

career advancement or entrepreneurship. Moreover, if departing employees are replaced, these new employees imply potential inflows of new knowledge and social relations (Corredoira and Rosenkopf, 2010; Kaiser, Kongsted, and Rønde, 2015). Although the replacement of human assets might be difficult and long-lasting, we assume that the negative effects on parent-firm performance of high-performer mobility are only temporary and that parent firms with productive complementary assets eventually recover (McKendrick et al., 2009). Moreover, we demonstrate that endogeneity is likely associated with positive effects on firm performance because better firms apparently have more spinoffs.

Our results show that a competitive transfer of knowledge and complementary assets from the parent firm through high-performers' mobility to a spinoff is conditional on employee tenure and, in some settings, spinoff size. Thus, not all spinoffs build on the complementary assets of parent firms and compete for the same clients and resources (Chatterji, 2009; Yeganegi et al., 2016), and spinoff mobility is not a zero-sum game whereby spinoffs appropriate value at the expense of the parent firm. We do not assess whether the value created by spinoffs offsets the negative impact on parent-firm performance. However, our results suggest that at least in some contexts, the overall economic benefit is positive. Cassiman and Ueda (2006) and Hellmann (2007) suggest that spinoffs often exploit opportunities that have been rejected by parent firms. Moreover, Yeganegi et al. (2016) show that employees who are engaged with the core technologies of the parent firm are *less* likely to found spinoffs, potentially because of intellectual property rights. As a result, the overlap is likely to be small (Chatterji, 2009). This condition may open the door to synergy and mutually beneficial cooperation or knowledge-sharing between parent firms and spinoffs (Kim and Steensma, 2017).

The prospect of negative performance effects might discourage firms from investing in the human capital of their high-performing employees, especially if they expect high employee turnover. Our findings support the apparent resistance of incumbent firms to the general departure of high-performing employees; however, they do not unequivocally support greater resistance to spinoff mobility. Instead, we show that additional negative impacts of spinoff mobility are conditional and not present in all settings. Therefore, incumbent firms should focus on general retention strategies for all high-performing employees and not specifically on preventing spinoff entrepreneurship.

Conclusion and future research

We follow Phillips (2002); Wezel et al. (2006); McKendrick et al. (2009); Campbell et al. (2012) and investigate the negative performance effects of spinoff mobility on parent-firm survival and sales. Extending their work, we investigate what conditions these effects and how they vary within different industries. Moreover, we estimate the effects of spinoff mobility on parent-firm performance while controlling for high-performer mobility in general. This allows us to approximate the separate effects of spinoff mobility emerging from additional competition versus human capital depletion.

We find that high-performer mobility in general is associated with lower parent-firm performance. This finding illustrates that the negative performance effects of high-performer mobility are not restricted or unique to competitive departures such as spinoff mobility. Furthermore, we show that additional detrimental effects on parent firms from spinoff mobility are conditional on employee tenure and spinoff size, with employee tenure being the dominant effect in most settings. Moreover, we demonstrate that these mechanisms vary significantly by industry. These findings extend our understanding of how and when spinoff mobility affects parent-firm performance and under what circumstances they pose a threat to the parent firm. These results demonstrate that tenure at the parent firm allows the employee to accumulate human and social capital at the parent firm and better transfer human and complementary assets from the parent firm to the spinoff. This mechanism appears particularly relevant in client-based industries. Furthermore, the evidence suggests that spinoff size conditions the ability to absorb, recreate and appropriate parent-firm complementary assets.

We argue that high-performer mobility facilitates the transfer of human and complementary assets from parent firms to spinoffs. However, we cannot directly measure knowledge, social relations and other human or complementary assets. We also do not observe whether or how easily any high performer is replaced. Consequently, we cannot rule out the possibility that the detrimental effects of spinoff mobility by long-tenure employees are partly due to increased difficulties of finding and recruiting suitable replacements for this group of high performers. However, we control for leavers' and non-leavers' tenure together with other high-performer characteristics, and we would expect that replacement costs are comparable. Nevertheless, for these reasons, we cannot determine what factors have the largest impact in driving the additional effects on parent-firm performance

(e.g., additional replacement costs, organizational disruptions, or the accumulation and competitive transfer of human and complementary assets) from spinoff mobility or how this might vary across industries. Similarly, we cannot observe how employee tenure relates to human asset accumulation or how spinoff size affects the ability to absorb or recreate parent-firm complementary assets. Thus, we cannot provide direct tests of the mechanisms but only observe parent-firm outcomes after mobility events. We leave these questions for future research.

Except for spinoff size and proximity to the parent firm, we do not investigate how other characteristics of the spinoff affect parent-firm performance. We expect, however, that greater similarity between the parent firm and the spinoff will increase the competitive fallout. In addition to the geographical dimension that we account for, other factors such as similarity in the institutional, socioeconomic and historical environment might increase the likelihood of competition for the same resources (Sørensen, 1999; Wezel et al., 2006). Greater similarity might also increase the spinoff's absorptive capacity (Corredoira and Rosenkopf, 2010). We encourage future researchers to further investigate the circumstances under which high-performer mobility enables the spinoff to absorb, recreate and appropriate parent-firm complementary assets.

As with similar empirical studies, we are concerned about endogeneity in the form of selection bias and/or omitted variable bias. In our case, we expect that the decision of a high-performing employee to leave the parent firm could be explained by expectations about the parent firm's future performance – in other words, the sinking-ship phenomenon. Contradicting this possibility, we show a positive correlation between parent-firm performance and high performers' mobility to spinoffs. Ideally, we would study these issues in a randomized experiment that randomly assigns departures from random parent firms to different destinations. While this design is not feasible in a real-world setting, we have attempted to address these concerns in as much detail as possible given the data at hand.

In contrast to previous studies of spinoffs and high-performer mobility, which limit themselves to one industry or geographical area, we have investigated the phenomenon more generally. In addition, we have shown that our findings apply to a number of different industries. We have focused on industries that rely to varying degrees on social relations, local markets, and the intensity of tangible, nonhuman capital assets. Future research should strive to outline in greater detail the industries and circumstances in which spinoffs impact parent-firm performance. For example, in

knowledge- and technology-intensive industries, the transferability and appropriation of the parent firm's human assets might rely heavily on existing productive complementary assets. This suggests that venture capital-backed startups might have the necessary resources to compete in markets that require significant investments in complementary tangible assets (Yeganegi et al., 2016). Future studies should also focus on spinoffs founded by lower-ranked employees and investigate small firms (i.e., those with fewer than ten employees).

Another limitation is that we do not distinguish between individual and collective mobility. The transfer or re-creation of parent-firm complementary assets, for example, organizational routines, is more likely to succeed and thereby pose a threat to the parent firm when the organization's members leave as a group (Wezel et al., 2006). Messersmith, Lee, Guthrie, and Ji (2014) argue that increased rates of high-performer mobility lead to a detrimental depletion of the parent firm's resources. While individual mobility also implies a loss of human and social capital, collective mobility further erodes performance, as shared experience and knowledge are lost. Furthermore, collective mobility is more likely to disrupt social structures and trigger organizational change in the parent firm than departures of individual employees (Messersmith et al., 2014). Future research should address how the mobility of teams and groups of employees to spinoffs might multiply these effects.

Finally, in many ways, the Danish labor market resembles that of the U.S. Compared with many other European countries, the Danish labor market is less restrictive. The employer costs of firing employees are low, and annual rates of job creation and turnover resemble those of the U.S. labor market (Sørensen and Sorenson, 2007; Dahl and Klepper, 2015; Burton et al., 2018), which suggests that the effects on parent-firm performance of high-performer turnover might be larger in other European countries but similar in the U.S.

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Tables

Table 1
Descriptive statistics (2000-2012)

	All		Conditional on departure	
No. of observations (firm year)	241.271		104,683	
No. of firms	30,911		28,087	
No. of firm failures	12,736		11,762	
Legal form (personal liability, pct.)	12.39		10.42	
No. of high-performing employees (total, all years)	2,718,989		2,602,261	
No. of high-performer departures (total, all years)			397,450	
No. of high performers to spinoffs (total, all years)			8,299	
No. of high performers to nonrival startups (total, all years)			13,750	
No. of high performers to rival incumbents (total, all years)			84,674	
No. of high performers to nonrival incumbents (total, all years)			221,367	
No. of high performers to other destinations (total, all years)			69,360	
	Mean	Std. Dev.	Mean	Std. Dev.
Sales 1,000 kr. (2010 prices)	106,772	784,719	192,172	1,155,076
Sales, logged	17.13	1.61	17,72	1,51
Sales growth, pct.	-0.36	47.21	-7.35	45.55
Firm age, years	16.54	14.76	17.74	16.04
Salary, blue-collar, logged	12.72	0.23	12.73	0.23
Salary, white-collar, logged	12.84	0.24	12.86	0.25
Salary, TM, logged	13.02	0.36	13.08	0.37
High performers' age, years	35.80	16.44	41.75	5.67
High performers' tenure, logged	1.57	0.86	1.79	0.54
High performers' education, years	11.20	5.07	13.29	1.57
Males (share of high performers)	0.68	0.37	0.81	0.23
Blue-collar (share of high performers)	0.32	0.33	0.37	0.32
White-collar (share of high performers)	0.22	0.29	0.29	0.30
TM (share of high performers)	0.18	0.23	0.22	0.22
No. of high-performing employees (per year)	11.26	58.13	20.86	86.86
No. of high-performer departures (per year)	1.65	10.42	3.80	15.56
No. of high performers to spinoffs (per year)	0.03	0.29	0.08	0.44
No. of high performers to nonrival entrepreneurship (per year)	0.06	0.39	0.13	0.59
No. of high performers to rival incumbents (per year)	0.35	5.77	0.81	8.73
No. of high performers to nonrival incumbents (per year)	0.92	5.79	2.11	8.64
No. of high performers to other destinations (per year)	0.29	2.01	0.66	3.00
Ratio in pct. (0 to 100), high-performer mobility (total)	13.22	22.35	30.47	25.03
Ratio in pct. (0 to 100), high-performer mobility to spinoffs	0.63	5.93	1.44	8.94
Ratio in pct. (0 to 100), high-performer mobility to nonrival startups	0.60	4.56	1.38	6.85
Ratio in pct. (0 to 100), high-performer mobility to rival incumbents	3.14	11.72	7.24	16.93
Ratio in pct. (0 to 100), high-performer mobility to nonrival incumbents	6.51	14.28	15.00	18.51
Ratio in pct. (0 to 100), high-performer mobility to other	2.35	8.04	5.41	11.50
High performers' tenure, years (all departures)			4.41	4.05
High performers' tenure, years (h-p to spinoffs)			4.90	4.33
High performers' tenure, (years, logged) (all departures)			1.48	0.61
High performers' tenure, (years, logged) (h-p to spinoffs)			1.55	0.65
High performers' tenure, (standard deviation, logged) (h-p to spinoffs)			0.35	0.67
Spinoff size (ft. emp, logged)			1.36	0.98
Spinoff size, (standard deviation, logged) (h-p to spinoffs)			0.07	0.41
			Local mobility	Distant mobility
No. of high-performer departures (total, all years)			368,615	28,835
No. of high performers to spinoffs (total, all years)			7,991	308

The category 'conditional on departure' only includes firm-year observations if one or more high performers depart that year.

Table 2
Exponential survival models (AFT) and fixed effects panel regressions of sales$_{t+1}$, logged

	Survival		Sales		Survival
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Ratio h-p departures, lagged	-0.036**	-0.020**	-0.004**	-0.011**	-0.019**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ln(tenure), h-p leavers, lagged				0.024**	-0.066**
				(0.006)	(0.011)
Constant	4.038**	5.717**	16.356**	14.348**	5.492**
	(0.068)	(0.627)	(0.272)	(0.489)	(0.630)
R^2			0.04	0.20	
Adjusted R^2			0.04	0.20	
Log-likelihood	-8864	-1066	-358397	-334951	-1056
Observations	241271	241271	251519	251519	241271

** $p < 0.01$, * $p < 0.05$, † $p < 0.10$. Clustered standard errors in parentheses.
We include unreported controls for the number of full-time employees, legal form, year dummies, labor-market region (12 dummies), industry (11 dummies), and wage level (average wage level of top managers and white- and blue-collar workers). For high-performing leavers and non-leavers, separately, we control for tenure, age, age squared, education, gender, and occupation (TM, white-collar, and blue-collar shares).The sales models also include firm age (logged). Full models are available in Online Appendix.

Table 3
Exponential survival models (AFT) and fixed effects panel regressions of sales$_{t+1}$, logged

	Survival	Sales	Survival	Sales	Survival	Sales	Heckman
	(6)	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
Ratio, h-p departures, lagged	-0.020**	-0.011**	-0.020**	-0.011**	-0.020**	-0.011**	-0.018**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ratio, h-p to spinoffs, lagged	0.002**	-0.000	0.001**	0.001	0.003**	0.001	-0.002*
	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
H-p to spinoffs, ln(tenure), lagged	-0.141**	0.005			-0.136**	0.041*	0.056*
	(0.017)	(0.016)			(0.018)	(0.019)	(0.024)
H-p to spinoffs, ln(tenure std. dev.), lagged	0.063**	-0.037			0.065**	-0.052	0.034
	(0.021)	(0.050)			(0.021)	(0.053)	(0.042)
H-p to spinoffs, ln(size), lagged			-0.057**	-0.063**	-0.012	-0.081**	-0.076**
			(0.015)	(0.015)	(0.016)	(0.017)	(0.024)
H-p to spinoffs, ln(size std. dev.), lagged			-0.031	0.180*	-0.053†	0.195*	0.058
			(0.025)	(0.084)	(0.028)	(0.089)	(0.061)
Constant	5.725**	14.349**	5.724**	14.348**	5.740**	14.349**	1.352**
	(0.627)	(0.489)	(0.627)	(0.489)	(0.627)	(0.489)	(0.265)
R^2		0.20		0.20		0.20	
Adjusted R^2		0.20		0.20		0.20	
Log-likelihood	-1054	-334950	-1063	-334932	-1053	-334926	
Observations	241271	251519	241271	251519	241271	251519	264830

** $p < 0.01$, * $p < 0.05$, † $p < 0.10$. Clustered standard errors in parentheses.
We include unreported controls for the number of full-time employees, legal form, year dummies, labor-market region (12 dummies), industry (11 dummies), and wage level (average wage level of top managers and white- and blue-collar workers). For high-performing leavers and non-leavers, separately, we control for tenure, age, age squared, education, gender, and occupation (TM, white-collar, and blue-collar shares). The sales models also include firm age (logged). Full models are available in Online Appendix.

Table 4
Exponential survival models (AFT) and fixed effects panel regressions of sales_{t+1}, logged

	Survival (13)	**Sales (14)**	**Survival (15)**	**Sales (16)**	**Heckman (17)**
Ratio, h-p departures, lagged	-0.020**	-0.011**	-0.020**	-0.011**	-0.018**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ratio, h-p to local spinoffs, lagged	-0.000	-0.000	0.003**	0.001	-0.002*
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Ratio, h-p to distant spinoffs, lagged	0.003	0.003	0.006	0.004	-0.004
	(0.004)	(0.005)	(0.004)	(0.005)	(0.006)
H-p to spinoffs, ln(tenure), lagged			-0.136**	0.041*	0.056*
			(0.018)	(0.019)	(0.024)
H-p to spinoffs, ln(tenure std. dev.), lagged			0.066**	-0.052	0.034
			(0.021)	(0.054)	(0.042)
H-p to spinoffs, ln(size), lagged			-0.013	-0.081**	-0.076**
			(0.016)	(0.017)	(0.024)
H-p to spinoffs, ln(size std. dev.), lagged			-0.053†	0.194*	0.058
			(0.027)	(0.089)	(0.061)
Constant	5.713**	14.349**	5.736**	14.350**	1.352**
	(0.627)	(0.489)	(0.627)	(0.489)	(0.265)
R^2		0.20		0.20	
Adjusted R^2		0.20		0.20	
Log-likelihood	-1066	-334950	-1053	-334926	
Observations	241271	251519	241271	251519	264830

** $p < 0.01$, * $p < 0.05$, † $p < 0.10$. Clustered standard errors in parentheses.
We include unreported controls for the number of full-time employees, legal form, year dummies, labor-market region (12 dummies), industry (11 dummies), and wage level (average wage level of top managers and white- and blue-collar workers). For high-performing leavers and non-leavers, separately, we control for tenure, age age squared, education, gender, and occupation (TM, white-collar, and blue-collar shares). The sales models also include firm age (logged). Full models are available in Online Appendix.

Table 5
Industry analysis: manufacturing industry

	Exponential survival model (AFT)						Fixed-effects panel regression of sales$_{t+1}$, logged					
	(18)	**(19)**	**(20)**	**(21)**	**(22)**	**(23)**	**(24)**	**(25)**	**(26)**	**(27)**	**(28)**	**(29) Heckman**
Ratio h-p departures, lagged	-0.023**	-0.023**	-0.023**	-0.023**	-0.023**	-0.023**	-0.013**	-0.013**	-0.013**	-0.013**	-0.013**	-0.019**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Ratio, h-p to spinoff, lagged	0.001	0.003*	0.001	0.002†			0.003	0.005**	0.005**			
	(0.000)	(0.001)	(0.001)	(0.001)			(0.002)	(0.002)	(0.002)			
H-p to spinoffs, ln(tenure), lagged		-0.096**		-0.104**		-0.105**	-0.026		0.050		0.050	0.038
		(0.036)		(0.038)		(0.038)	(0.036)		(0.058)		(0.058)	(0.076)
H-p to spinoffs, ln(tenure std. dev.), lagged		0.029		0.029		0.029	-0.067		-0.060		-0.060	-0.022
		(0.048)		(0.048)		(0.048)	(0.136)		(0.135)		(0.135)	(0.105)
H-p to spinoffs, ln(size), lagged			-0.020	0.019		0.020		-0.149*	-0.170†		-0.169†	-0.186*
			(0.042)	(0.044)		(0.044)		(0.065)	(0.088)		(0.088)	(0.081)
H-p to spinoffs, ln(size std. dev.), lagged			-0.067†	-0.079*		-0.079*		0.361**	0.374**		0.374**	0.210
			(0.039)	(0.037)		(0.037)		(0.111)	(0.121)		(0.122)	(0.302)
Ratio, h-p to local spinoffs, lagged					0.001	0.002†				0.001	0.005**	0.002
					(0.000)	(0.001)				(0.002)	(0.002)	(0.003)
Ratio, h-p to distant spinoffs, lagged					0.026	0.041				0.003*	0.006*	0.001
					(0.031)	(0.031)				(0.001)	(0.003)	(0.015)
Constant	5.584**	5.628**	5.569**	5.633**	5.592**	5.647**	12.641**	12.646**	12.648**	12.638**	12.648**	1.894**
	(2.153)	(2.154)	(2.153)	(2.155)	(2.154)	(2.157)	(0.908)	(0.907)	(0.908)	(0.907)	(0.908)	(0.663)
R^2							0.26	0.26	0.26	0.26	0.26	
Adjusted R^2							0.26	0.26	0.26	0.26	0.26	
Log-likelihood	387	387	387	387	387	387	-49564	-49555	-49554	-49566	-49554	
Observations	42803	42803	42803	42803	42803	42803	46020	46020	46020	46020	46020	47903

** $p < 0.01$, * $p < 0.05$, † $p < 0.10$. We include unreported controls for the number of full-time employees, legal form, year dummies, labor-market regions (12 dummies), and wage level (average wage level of top managers and white- and blue-collar workers).For high-performing leavers and non-leavers, separately, we control for tenure, age, age squared, education, gender, occupation (TM, white-collar and blue-collar shares). The sales models also include firm age (logged).

Table 6
Industry analysis: locally competitive industries

	Exponential survival model (AFT)						Fixed-effects panel regression of sales$_{t+1}$, logged					
	(30)	**(31)**	**(32)**	**(33)**	**(34)**	**(35)**	**(36)**	**(37)**	**(38)**	**(39)**	**(40)**	**(41)**
Ratio, h-p departures, lagged	-0.020**	-0.020**	-0.020**	-0.020**	-0.020**	-0.020**	-0.010**	-0.010**	-0.010**	-0.010**	-0.010**	-0.017**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ratio, h-p to spinoff, lagged	0.000	0.003**	0.002*	0.003**			-0.002	0.001	-0.000			
	(0.000)	(0.001)	(0.001)	(0.001)			(0.001)	(0.001)	(0.001)			
H-p to spinoffs, ln(tenure), lagged		-0.143**		-0.142**		-0.143**	0.024		0.072**		0.072**	0.034
		(0.027)		(0.030)		(0.030)	(0.021)		(0.023)		(0.023)	(0.034)
H-p to spinoffs, ln(tenure std. dev.), lagged		0.069*		0.069*		0.071*	-0.039		-0.046		-0.043	0.021
		(0.032)		(0.032)		(0.032)	(0.078)		(0.081)		(0.081)	(0.059)
H-p to spinoffs, ln(size), lagged			-0.056*	-0.002		-0.002		-0.080**	-0.109**		-0.112**	-0.050
			(0.025)	(0.027)		(0.027)		(0.020)	(0.022)		(0.022)	(0.033)
H-p to spinoffs, ln(size std. dev.), lagged			-0.010	-0.032		-0.034		0.056	0.070		0.065	0.022
			(0.045)	(0.049)		(0.049)		(0.051)	(0.061)		(0.061)	(0.089)
Ratio, h-p to local spinoffs, lagged					0.000	0.003**				-0.002	-0.000	-0.004**
					(0.000)	(0.001)				(0.001)	(0.001)	(0.001)
Ratio, h-p to distant spinoffs, lagged					0.007	0.011				0.010†	0.012*	-0.006
					(0.008)	(0.008)				(0.005)	(0.006)	(0.009)
Constant	10.994**	10.970**	10.983**	10.976**	10.971**	10.950**	14.506**	14.508**	14.508**	14.515**	14.517**	7.064**
	(1.460)	(1.460)	(1.460)	(1.460)	(1.461)	(1.461)	(0.571)	(0.571)	(0.571)	(0.571)	(0.571)	(0.512)
R^2							0.22	0.22	0.22	0.22	0.22	
Adjusted R^2							0.22	0.22	0.22	0.22	0.22	
Log-likelihood	-571	-566	-570	-566	-571	-566	-99405	-99393	-99383	-99403	-99379	
Observations	83162	83162	83162	83162	83162	83162	89828	89828	89828	89828	89828	94359

** $p < 0.01$, * $p < 0.05$, † $p < 0.10$. We include unreported controls for the number of full-time employees, legal form, year dummies, labor-market regions (12 dummies), and wage level (average wage level of top managers and white- and blue-collar workers). For high-performing leavers and non-leavers, separately, we control for tenure, age, age squared, education, gender, occupation (TM, white-collar and blue-collar shares). The sales models also include firm age (logged).

Table 7
Industry analysis: client-based industries

	Exponential survival model (AFT)						Fixed-effects panel regression of sales, logged					
	(42)	**(43)**	**(44)**	**(45)**	**(46)**	**(47)**	**(48)**	**(49)**	**(50)**	**(51)**	**(52)**	**(53)**
Ratio h-p departures, lagged	-0.023**	-0.022**	-0.022**	-0.022**	-0.023**	-0.022**	-0.012**	-0.012**	-0.012**	-0.012**	-0.012**	-0.019**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Ratio, h-p to spinoff, lagged	-0.000	0.004*	0.002	0.004*			-0.004	-0.002	-0.003			
	(0.001)	(0.002)	(0.001)	(0.002)			(0.005)	(0.004)	(0.005)			
H-p to spinoffs, ln(tenure), lagged		-0.268**		-0.252**		-0.252**	0.051		0.088		0.088	0.121
		(0.068)		(0.071)		(0.071)	(0.045)		(0.060)		(0.059)	(0.085)
H-p to spinoffs, ln(tenure std. dev.), lagged		0.181†		0.181†		0.176†	-0.063		-0.090		-0.102	-0.073
		(0.094)		(0.095)		(0.095)	(0.154)		(0.176)		(0.178)	(0.178)
H-p to spinoffs, ln(size), lagged			-0.073†	-0.024		-0.025		-0.054*	-0.090†		-0.090*	-0.072
			(0.042)	(0.040)		(0.040)		(0.027)	(0.046)		(0.045)	(0.084)
H-p to spinoffs, ln(size std. dev.), lagged			-0.122	-0.079		-0.082		0.144	0.167		0.168	0.194
			(0.088)	(0.098)		(0.098)		(0.115)	(0.144)		(0.144)	(0.207)
Ratio, h-p to local spinoffs, lagged					-0.000	0.005**				-0.003	-0.002	-0.005
					(0.001)	(0.002)				(0.004)	(0.004)	(0.004)
Ratio, h-p to distant spinoffs, lagged					-0.006*	-0.001				-0.029	-0.029	-0.035
					(0.003)	(0.003)				(0.041)	(0.041)	(0.026)
Constant	5.276*	5.257*	5.343*	5.291*	5.265*	5.283*	12.004**	11.999**	11.990**	11.977**	11.962**	5.895**
	(2.318)	(2.326)	(2.325)	(2.331)	(2.319)	(2.332)	(1.442)	(1.444)	(1.445)	(1.442)	(1.446)	(1.130)
R^2							0.15	0.15	0.15	0.15	0.15	
Adjusted R^2							0.15	0.15	0.15	0.15	0.15	
Log-likelihood	-318	-314	-317	-314	-317	-314	-31164	-31164	-31162	-31163	-31160	
Observations	19867	19867	19867	19867	19867	19867	20208	20208	20208	20208	20208	21244

** $p < 0.01$, * $p < 0.05$, † $p < 0.10$. We include unreported controls for the number of full-time employees, legal form, year dummies, labor-market regions (12 dummies), and wage level (average wage level of top managers and white- and blue-collar workers). For high-performing leavers and non-leavers, separately, we control for tenure, age, age squared, education, gender, occupation (TM, white-collar and blue-collar shares). The sales models also include firm age (logged).