RETAINING EMPLOYEES WHEN STARTUPS PROFESSIONALIZE

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ABSTRACT

The delegation of decision-making authority from founders to dedicated managers is an important step in the professionalization of startups. However, such delegation changes the distinct nature of startups as workplaces with frequent interaction between founders and their employees. We build on theory of relational disruption in workplaces and theorize how delegation of decision-making authority affects employee retention. We reason that through delegation, employees lose opportunities to learn from founders and influence startup decisions. As a result, relational advantages of startup employment decrease, leading to employee mobility. Moreover, employees are particularly likely to leave after decision-making has been delegated when they are early in their careers and when founder teams are small. Using a sample of 13,737 employees in 1,797 German startups, we find support for our conjectures.

Keywords: startup professionalization, delegation, retention, founders, relational disruption

INTRODUCTION

Founders typically play an outsized role for the success of their startups (Dencker and Gruber, 2015; Hashai and Zahra, 2021). They are the primary decision-makers of the startup (Gifford, 1992; Nelson, 2003), its major source of creativity (Zahra and Filatotchev, 2004) and role models for their employees (Rocha and van Praag, 2020). However, as startups grow, founders reach the limits of their management capacities (Boeker and Karichalil, 2002; Hellmann and Puri, 2002) and experience that they can no longer devote sufficient attention to the most strategic activities of the startup (Acs and Gifford, 1996; Grimpe, Murmann, and Sofka, 2019). At this stage, founders oftentimes start delegating decision rights to managerial or administrative specialists in an effort to alleviate the burden on their own attention as well as to improve coordination and efficiency within the startup (Colombo and Grilli, 2013; Sine, Mitsuhashi, and Kirsch, 2006). While this delegation is an important step for the professionalization of a startup, it changes the nature of the workplace. Startups are unique workplaces attracting employees who prefer flat hierarchies with many learning opportunities and dynamically changing tasks (Sørensen, 2007; Campbell, 2013; Sorenson *et al.*, 2021). Once the nature of this work environment begins to change, with founders becoming increasingly removed from the day-to-day interaction with their employees, startups can lose their distinct attractiveness as workplaces and employees may consider leaving. However, extant theory provides little guidance for these potentially adverse effects of startup professionalization on the retention of its employees.

In this study, we build on theory of relational disruption in the workplace (Bidwell and Fernandez-Mateo, 2010; Baek, Bidwell, and Keller, 2021). Within this logic, work interactions shape personal relationships (Granovetter, 1992). We explicate the mechanisms from relational disruption to the specific situation of founders beginning to delegate decision-making authority

and theorize that this change in the organizational design makes it harder for startup employees to (a) learn from the founders as the prime knowledge sources of the startup (Zahra, Filatotchev, and Wright, 2009), and (b) influence the strategic decision-making of founders (Gifford, 1992). Consequently, we argue that the delegation of decision-making authority by the founders increases the likelihood that startup employees will leave.

The importance of employees' ability to learn from founders and to influence decision-making for the decision to leave the startup likely overlap. Hence, we investigate two contingency factors to isolate the presence of both mechanisms and focus on two conditions under which one mechanism is likely more pronounced than the other and vice versa. Specifically, we reason that young professionals working for startups will be particularly concerned about losing direct access to founders as sources of learning once founders start delegating decision-making authority. These young professionals are early in their careers and in the process of building a stock of professional skills while more senior startup employees might see learning opportunities as less important for their decision to stay with the startup. Moreover, we theorize that the effect of delegating decision-making authority on employee's decision to leave the startup will be particularly strong when founder teams are small or when there is even a single founder. In these cases, employees are more likely to lose influencing opportunities compared to when the startup is led by a larger team of founders who may be more likely to discuss strategic decisions among themselves.

We test our theoretical predictions using a sample of 13,737 employees working for 1,797 German startups that are surveyed as part of the IAB/ZEW Start-up Panel. Based on duration models, individual-level fixed effects models and instrumental variables models, we find empirical support for our theoretical conjectures.

Our findings advance extant research in two primary ways. First, the professionalization of startups is a central topic of theory on the evolution of startups along their organizational life cycle (Gedajlovic, Lubatkin, and Schulze, 2004; Zahra and Filatotchev, 2004). The delegation of decision-making authority from founders to dedicated managers is an important threshold because it often occurs early in the life cycle and affects the inherent attention constraints of founders (Colombo and Grilli, 2013; Grimpe *et al.*, 2019). However, the adverse effects on employee retention, arguably a strategic resource in resource-constrained startups, are hardly understood. Our theory on the effects of relational disruption following the delegation of decision authority by founders brings these adverse effects to the forefront and allows for a more complete theoretical understanding of how professionalization changes startups.

Second, extant research emphasizes the critical importance of attracting skilled employees to startups (Clough *et al.*, 2018; Grillitsch, Schubert, and Srholec, 2019) and highlights the distinct work conditions for achieving this even when salaries are comparatively lower (Sorenson *et al.*, 2021). This theoretical logic about the importance of human capital for startups is incomplete when it does not incorporate the retention aspect. Our theorizing is a first important step in the direction of understanding not only the attraction of startup employees but also what keeps them attached to a young firm.

THEORY AND HYPOTHESES

The attraction of skilled employees is central for startup success (Clough *et al.*, 2018; Agarwal, 2019). Founders need to address the inherent capability shortages in startups through hiring (Grillitsch and Schubert, 2021). This is a challenging task as startups can rarely offer the salary levels of established firms but they can compensate with attractive work environments (Sorenson

et al., 2021). While the attraction aspect of startup employees is a primary focus of research in entrepreneurship, the retention aspect is hardly covered by extant theory. This is surprising because startups typically lack the personnel capacities to cope with the turnover of key employees. Research on retention and employee turnover emphasizes how severely personnel turnover affects firm performance in general (Stern *et al.*, 2021) and in a startup context in particular (Baron, Hannan, and Burton, 2001; Murmann, 2017). Firms that cannot retain key employees find it difficult to coordinate complex tasks (Briscoe and Rogan, 2015), the productivity of the remaining employees drops (Campbell *et al.*, 2012), and organizational failure rates increase (Phillips, 2002). We reason that the retention of startup employees is determined by the distinct work environment in which hierarchies are low and interaction with the startups' founders, i.e. its top managers, is frequent and direct. Naturally, that makes employee retention subject to changes in the interaction between founders and employees.

Startups are unique workplaces. They offer flat hierarchies in the early stages (Sørensen, 2007), learning opportunities from frequently changing tasks spanning all business areas (Campbell, 2013; Lazear, 2005), and dynamic decision-making in changing market environments (Sorenson *et al.*, 2000; Gedajlovic *et al.*, 2004). Most startups lack a dedicated organizational design but follow general blueprints about work values and procedures that reflect the preferences and priorities of their founders (Baron, Burton, and Hannan, 1999; Leung, Der Foo, and Chaturvedi, 2013). Further, founders are the major source of creativity and innovativeness for their startups (Zahra *et al.*, 2009). Their technologies, business opportunities, or acumen are oftentimes the starting point of the startup. Finally, founders are the central decision-makers of startups (Nelson, 2003). They are typically the startups' dominant shareholders which provides them with the authority and the legitimacy to determine and revise fundamental startup strategies

(Gedajlovic *et al.*, 2004). Hence, startups are unique workplaces in which employees work directly with the individuals, i.e. the founders, who provide the knowledge base of their organization and are its central decision-makers.

The nature of employees' interactions with the founders changes in many startups once they progress through their life cycle by reaching substantial revenue levels (Daily and Dalton, 1992) and stable market positions (Gedajlovic *et al.*, 2004) or prepare for initial public offerings (Wu and Hsu, 2018). The multitude of tasks puts strains on the founders' capacities to manage various firm functions and devote sufficient attention to the ones that are strategic for the startup (Gifford, 1992; Acs and Gifford, 1996). Founders typically respond by delegating decision-making for certain activities to dedicated managers (Baron *et al.*, 1999; Colombo and Grilli, 2013). The new organizational design is supposed to improve startup efficiency and coordination (Sine *et al.*, 2006). However, it also alters the information processing within startups in two ways. First, information can be processed in parallel (Radner, 1993). This implies that information about certain business areas may no longer reach the founder and is instead handled by dedicated managers. Second, the information flow becomes prioritized, i.e. dedicated managers handle decisions within their delegated authority (Garicano, 2000; Harris and Raviv, 2002). Information reaches founders only after it has been filtered and condensed. As a result, the relationship between founders and startup employees becomes increasingly indirect. Founders interact less with startup employees and startup employees lose access to founders which had allowed them to interpret, anticipate or influence their decision-making. We reason that the delegation of decision-making authority by founders therefore disrupts the relationship with startup employees and has consequences for their retention.

Our theoretical reasoning is based on the embeddedness of employee interaction in personal

relationships (Granovetter, 1992; Nahapiet and Ghoshal, 1998). Individuals develop this type of embeddedness through repeated interaction over time. This theoretical angle is particularly fitting for the startup context in which most interactions among colleagues are not structurally determined but emerge dynamically. Relational embeddedness creates a type of familiarity between individuals that facilitates knowledge flows because it clarifies potential sources of knowledge and expectations for knowledge exchanges (Reagans, Argote, and Brooks, 2005). Further, interpersonal trust can emerge in organizations (McAllister, 1995). As a result, the disruption of such relationships affects the workplace, e.g. the career outcomes of subordinates when their managers change jobs (Baek *et al.*, 2021). We reason that founders starting to delegate decision-making authority in startups disrupt the relationship that they have with their employees and make them more likely to leave the startup.

Retention is oftentimes a function of the specific, non-monetary incentives that employees have for staying with an employer. If employees receive distinct utility from working for a particular employer which they could not find with other employers, they are likely to stay with this employer even if it implies salary discounts (Kryscynski, Coff, and Campbell, 2020). This mechanism is particularly relevant for startups, which are rarely able to match the salaries of established firms (Sorenson *et al.*, 2021). The unique utility of startup employees does not just emerge from working in an entrepreneurial environment per se but from building specific relationships with founders over time. This type of relational embeddedness is unique since the startup context allows employees to interact directly and frequently with founders who are both the primary source of creativity for their organization (Zahra *et al.*, 2009) as well as their prime decision-makers (Gedajlovic *et al.*, 2004). Once the startup professionalizes and founders delegate decision-making authority to dedicated managers, the specific relationship with founders is disrupted

and its distinct retention effect reduced. We predict:

Hypothesis 1: Employees become more likely to leave a startup when founders decide to delegate decision-making authority.

The effects of learning and influencing opportunities on the decision of employees to leave the startup likely overlap. Therefore, we rely on two moderating factors to isolate the mechanisms that are at the heart of our baseline hypothesis for the retention effect, i.e. the loss of learning opportunities and the loss of influence. We start by focusing on the learning mechanisms and the conditions under which learning is particularly salient for startup employees. We identify differences in their career stages as a meaningful factor and reason that learning from founders is particularly salient for young professionals. Central for our reasoning is the notion that the acquisition of knowledge and skills is a cumulative process. Individuals gather professional knowledge, skills and experiences, for short: human capital (Ployhart and Moliterno, 2011), not just for performing their current tasks. Instead, they have incentives to acquire valuable human capital that will help them in their future careers (Becker, 1962). A close working relationship with founders can be particularly valuable in a startup context because founders typically provide the essential knowledge base for a startup (Zahra *et al.*, 2009). Such knowledge is not necessarily only of technological nature but includes the identification of market opportunities and the design of attractive products and services. Moreover, founders can offer mentoring which allows employees to clarify skill deficits and how they can be overcome (Rocha and van Praag, 2020). Large parts of this knowledge are tacit in nature and benefit from frequent interaction with founders.

Experienced startup employees can draw from a stock of human capital that they have acquired earlier in their careers. Young professionals, though, are in the process of accumulating

knowledge and skills. Hence, they should be particularly sensitive to when their access to founders is disrupted. Once young professionals can no longer interact with founders on a day-to-day basis but have to deal with specialized managers instead, their unique benefits of working for the particular startup decrease. We propose:

> *Hypothesis 2: Employees become more likely to leave a startup when founders decide to delegate decision-making authority, and this likelihood is higher if employees are young professionals.*

For isolating the retention effects of the loss of influence mechanism, we exploit heterogeneity in the size of founder teams of startups. Many startups are created by teams of founders (Lazar *et al.*, 2019). Team formation allows founders to combine a variety of experiences, e.g. in certain technologies or industries, that can be beneficial for a startup (Hashai and Zahra, 2021 provide a recent review). Naturally, the size of founder teams also affects the decision-making in startups. Large teams can pool capacities, attention, and expertise for making decisions. Small founder teams or single founders lack these opportunities and are comparatively more likely to discuss pressing issues and considerations with the startup employees. As a consequence, smaller founder teams provide startup employees with increased access to information about decisions and the options that are available. These conditions can be attractive for employees because they can gain a more comprehensive understanding of the startup's strategic challenges and influence the outcomes of decision-making.

We reason that the delegation of decision-making authority to dedicated managers is particularly consequential for the retention of startup employees when founder teams are small. Under these conditions, the disruption of relationships with the founders is particularly salient because employees had many opportunities to influence decision-making in the first place. Delegation

implies that employees find it harder to provide information to founders directly because dedicated managers filter, condense and prioritize the information flow (Garicano, 2000; Harris and Raviv, 2002). In startups with large founder teams, these opportunities are ex-ante more limited since large founder teams have capacities to discuss decisions among themselves. However, in startups with small founder teams employees are particularly likely to experience a loss of influence which had set their workplace apart from other employers. As a consequence, they are particularly inclined to explore other job opportunities following the delegation of decision-making authority. We propose:

> *Hypothesis 3: Employees become more likely to leave a startup when founders decide to delegate decision-making authority, and this likelihood decreases with the number of founders in the team.*

EMPIRICAL SETUP

Data

Our dataset combines individual-level data on the employment biographies of startups employees and founders from the employment statistics of the German Federal Employment Agency with firm-level data on German startups from the IAB/ZEW Start-up Panel (Grimpe *et al.*, 2019). The employment statistics are a rich source of detailed information on founders and their employees, i.e., wages, qualifications levels, start and end dates of employment in a given firm, or occupations. The IAB/ZEW Start-up Panel is a representative survey of legally independent German new ventures from all industries except primary, energy and public sectors. New ventures that participate once in the survey are subsequently followed for a maximum of seven years

(Vaznyte and Andries, 2019).[1] The survey data are collected using computer-aided telephone interviews and provide detailed information on founder characteristics and firm development.

As there is no common identifier in the two datasets, we match the establishments from the employment statistics to startups from the IAB/ZEW Startup Panel by means of a text search algorithm using startup names and addresses. The text search algorithm has proven to deliver very reliable results in various settings (Czarnitzki *et al.*, 2015). In addition, we match the founders' previous employment biographies (before starting up their own firms) via founder names, exact birthdates, and addresses. We are able to match about 90% of the startups from the IAB/ZEW Startup Panel that self-reported having employees subject to social security contributions (during a telephone interview) with the employment statistics.

In the present study, we analyze changes in the employees' likelihoods to leave a focal startup when the founders delegate decision-making authority to other employees. Therefore, we base our analyses on a year-by-year panel dataset on the employee level and enrich these data with founder-level and firm-level information. We restrict our sample to individuals who were not awarded with decision-making authority themselves and who were employed by the startup before the first delegation. For our estimations, we obtain 52,788 observations of 13,737 employees from 1,797 startups of the cohorts 2005-2015. We observe all employees until the end of the year 2017. Importantly, once matched with the survey data, we can retrieve all necessary longitudinal information from register data, and our panel data are not subject to panel attrition other than from closing businesses, which we account for in the model estimations.

[1] See Fryges, Gottschalk, and Kohn (2009) for a detailed description and Vaznyte and Andries (2019) for a recent application of the survey data including a discussion of the survey's sample response, which they rate as satisfactory.

Measures

We provide a list of measures used in this study and details on their construction in Table 1.

Dependent variable

We measure the decision to leave a focal startup by a dummy variable that takes a value of 1 in the year in which an individual's employment in a focal startup ends and a value of 0 in other years. We exclude employee-year observations from our analyses when they are censored because they end on the last day of our observation period of the register data, i.e., on December 31, 2017, and when they are from years in which a focal employing startup exits the market. When observations are censored, i.e., the individuals are still employed by the focal startup when the observation ends, we cannot be certain whether the individuals' employment continues or ends on the last day of observation. In a robustness check, we include observations ending on December 31, 2017, and set them to a value of 0 (corresponding to a continuance of the employment relationship beyond that day) and find no noticeable changes to our results.

Explanatory variables

Our main explanatory variables testing the three hypotheses are whether founders delegate decision-making authority (to test Hypothesis 1), the age of an employee and whether the employees started their career in the focal startup (to test Hypothesis 2), and the number of founders in a team (to test Hypothesis 3). Information on the delegation of decision-making authority is derived from occupation codes available in the employment register data. "Delegation of decision-making authority" is a dummy variable that takes a value of one in years in which a startup has dedicated employees whose occupation codes indicate a supervisory or managerial position (and a value of zero in the remaining years). The age of the employees (in years) is also taken from the employment register data as is a dummy variable indicating whether employees started their

careers (i.e., took their first job after reaching their highest degree) in a focal startup. Finally, the number of founders in a team is retrieved from survey data.

In addition, we control for a wide range of potentially confounding factors at the employee-, the founder-, and the startup-level that might explain why employees join or leave a firm. On the employee level, we include the employee's age and gender and whether the employee is of non-German origin. These factors may be highly influential for an employee's outside options in the labor market. With the same reasoning, we include measures for whether the employee has tertiary education and experience in technical or business occupations. In addition, to control for the employees' firm-specific productivity, we include their tenure in a focal startup in years, their average daily income in a year, and their rank in the wage distribution of the firm. At the level of the founders, we include controls for whether the founder (or at least one of the founders in the team) is female, of non-German origin, has graduated from tertiary education, holds patents, has started a firm before, or collected managerial experience as an employee. Finally, at the level of the startup, we include controls for the firm's age in years, the number of employees, the firm's employment growth rate, and industry fixed effects. In robustness checks, we include further control variables for contemporary and lagged firm-level employee turnover and the variety and the growth of different occupations offered by a firm.

[Insert Table 1 about here]

We provide summary statistics of all dependent and explanatory variables in Table 2. In our estimation sample, the employees are on average 38.9 years old when observed. 17% of observations stem from employees who graduated from tertiary education, 36% from female employees, and 7% from employees of non-German origin. 14% of observations are from employees who started their careers in the focal startup and they have been working in the startup for 2.7 years

on average. The firms' founders have significantly higher education on average than their employees (in 52% of the observations founders graduated from tertiary education) and are less likely to be female (20% of observations) or of non-German origin (2% of observations). Before founding the focal startup, they gathered significant entrepreneurial experience (47% of observations are from founders who had started their own firm before, 57% from founders who previously collected managerial experience as dependent employees). On average, the startups have existed for 5.9 years when they are observed and have 1.7 founders and 51 employees, with an average employment growth rate of 42%.

[Insert Table 2 about here]

An inspection of pairwise correlations between our independent variables does not indicate any worryingly high correlations (see Table 3). Consequently, also the Variance Inflation Factor (VIF) is far below usually applied critical values (average: 1.36; maximum: 2.28).

[Insert Table 3 about here]

Estimation approach and identification strategy

Our aim is to assess factors that are influential for the likelihood that an employee leaves a focal startup. Thus, we choose to estimate Cox proportional-hazard duration models with cluster-robust standard errors as the estimation method for our baseline models. To account for the use of panel data on the individual employees and to relieve the assumption of proportional hazards, we estimate Mixed-Effects Exponential Panel duration models as a first robustness check. A major empirical challenge in our setting is endogeneity between the delegation of decision-making authority and an individual's likelihood to leave a firm. Such endogeneity can either lead to an exaggeration or an understatement of the true effect of delegation. For example, an individual

might leave a firm while, simultaneously, others get hired or promoted due to unobserved differences in the employees' productivity. On the contrary, a delegation of decision-making authority might become necessary when a firm successfully grows, simultaneously leading to a reduction of the likelihood to leave a firm for other employees.

We address endogeneity concerns in several ways. First, we include a wide range of control variables in our baseline models to reduce unobserved heterogeneity between employees and founders and their decisions to a minimum. Second, we use the fact that Cox proportional hazard models can be equivalently estimated as Poisson models, for which the estimation of individual-level fixed effects models is feasible, to abstract from any remaining time-constant unobserved heterogeneity. Finally, we estimate Poisson and linear Instrumental Variables (IV) models to also abstract from potential time-varying unobserved heterogeneity. As instruments in the IV regressions, we use (1) the predicted number of candidates for managerial positions in a focal startup and (2) the likelihood that comparable startups delegate decision-making authority to employees. The predicted number of candidates for managerial positions qualifies as an instrument as it is an exogenous driver of the supply of potential candidates for positions with decision-making authority. It is derived by multiplying data on the numbers of employees in bankrupt local businesses in the same industry by the share of employees in team-leader positions in businesses in the same size class and industry. The likelihood that comparable startups, i.e., those in the same industry, delegate decision-making authority to employees, qualifies as an instrument as it is an exogenous proxy for a startup's demand for employees who can take over positions with decision-making authority.

RESULTS

We find consistent support for our hypotheses based on Cox baseline estimates and all robustness checks (Table 4). In support of Hypothesis 1, when founders begin to delegate decision-making authority to some of their employees, the hazard that other employees leave the firm increases by a factor of 4.5 (see column A). Repeating the estimation by a Mixed Effects Exponential duration model, which allows to relieve restrictions of our baseline model with respect to the use of panel data and the assumption of proportional hazards, leads to very similar results (not reported). Regarding endogeneity concerns, our results remain fully consistent when we re-estimate our baseline model by an individual-level fixed effect Poisson model, allowing us to abstract from time-varying unobserved heterogeneity between individuals (column B) and when we repeat estimation with instrumental variables models to exclude the possibility that time-variant unobserved heterogeneity drives our results (column C). Standard post-estimation checks of the instrumental variable models suggest that our instruments are appropriate, as the relevance of the instruments as measured by the joint first-stage F-statistic of the instruments clearly exceeds critical levels for weak instruments (F-statistic >> 10) and the Hansen J test for over-identifying restriction does not reject the joint validity of the instruments (p-value >> 0.10). Overall, our results suggest that the delegation of decision-making authority can impose significant challenges to a startup's capability to retain employees who are not awarded such authority.

[Insert Table 4 about here]

Turning to the moderating factors of this relationship, our results are in line with Hypothesis 2. Interacting the delegation of decision-making authority with the age of the employees shows that older employees are increasingly less affected by a delegation of decision-making authority to others (column D). Consistently, interacting the delegation of decision-making authority with

whether employees began their career in a focal startup shows that those who started their careers in a focal startup are more likely to leave when decision-making authority is delegated (column E). Taken together, we retain that young professionals are more likely than older employees to leave a startup when founders decide to delegate decision-making authority to others, thereby reducing the young professionals' opportunities to learn from the founders through direct interaction. In a robustness check, we use an individual's wage differential when moving to a focal startup as an alternative moderator to identify situations in which individuals join startups hoping for learning opportunities. Consistent with the results using the employees' ages and career starts as moderators, delegating decision-making authority affects employee retention increasingly negatively when employees accepted a higher wage discount when moving to a focal startup (not reported).

Finally, in support of Hypothesis 3, interacting the delegation of decision-making authority with the number of founders in a team indicates that employees are less affected by the delegation of decision-making authority to others when founder teams are larger (column F). This is consistent with the view that even before any delegation of decision-making authority to employees, larger founder teams offer fewer opportunities for employees to influence a startup's strategic direction. Therefore, the loss of influence is arguably smaller when larger founder teams delegate decision-making authority and the retention of employees is less affected.

We estimate a series of robustness checks to assess the sensitivity of our results. With respect to model specifications, we find consistent results when we derive baseline estimated by OLS models and repeat instrumental variables estimation by an IV Poisson model. Our results also remain consistent if we include additional control variables for (1) the variety of occupations offered by a firm and its growth, to account for potential adjustments in employee human capital

that come simultaneously with the delegation of decision making and might explain employees' departures and (2) firm-level employee turnover in the year of an employee's departure and the two previous years, to further account for the possibility that both delegation of decision making and employee turnover might be a result of firm-level restructuration of the workforce. We had previously excluded both types of control variables due to endogeneity concerns, as both measures might be directly affected by an employee's separation or might be intermediate outcomes of the effect of delegation on employee separations. To test the plausibility of further alternative mechanism that might generate our results, we use split sample analyses and differentiate between different types of employees with and without delegated decision making authority. First, to understand whether employees might intend to leave a company because former coworkers got promoted while they did not, we split employees with decision-making authority for those who were promoted within in firm and those were hired from the outside. The effects on separation probabilities are positive and significant for both groups and larger for outside middle managers. Hence, our results do not seem to be driven by promoted coworkers. Second, to address the possibility that employees did not leave intentionally but were dismissed by the firm, we test the robustness of our results for a subgroup of employees who earned higher wages in the first year after leaving a focal startup than in the last year in the startup. This group of employees should be more likely to have left voluntarily than those who earn lower wages after leaving a startup. We find effect sizes that are of comparable magnitude to the baseline effect in the restricted sample. Third, in a series of sensitivity checks, we only keep leaving employees in the sample who switch to other either young firms, small firms, or firms with few managerial positions, i.e., likely those employees selecting into other work environments with low levels of

formalization. This should isolate those individuals for whom direct access to the ultimate decision makers is of highest importantance. Our results remain fully consistent in all tested situations. Fourth, we split employees who were awarded with decision-making authority for those in technical occupations and those in business occupations. Our results suggest that in both cases giving decision-making authority to employees comes with a higher likelihood of other employees leaving a startup, Fifth, we account for the effect that employees from larger firms are overrepresented in our estimation sample as larger firms, by definition, employ more workers. To make sure that we can derive advice on the firm level, we reweight observations by the inverse of the firm size and find our results to be robust.

DISCUSSION

We conduct this study to explore the potentially hidden costs of startup professionalization. Our theorizing is supposed to provide a more complete picture of the effects of professionalization which makes startups not just more stable and efficient organizations (Gedajlovic *et al.*, 2004; Zahra and Filatotchev, 2004) but also reduces their distinctiveness as a workplace in which employees interact freely and regularly with founders as the top management. Once these distinct advantages are reduced, the risk of losing skilled employees increases.

We focus on a particular aspect of startup professionalization in our theorizing, i.e. the delegation of decision-making authority from founders to dedicated managers, because such delegation often occurs early in a startup's lifecycle and is almost unavoidable given the limited capacities of founders for attending to all relevant aspects of a growing startup (Gifford, 1992; Grimpe *et al.*, 2019). We tie this introduction of an organizational design to theory on the effects of relational disruption in the workplace which constrains knowledge exchanges and trust (Baek *et al.*,

2021). Within a startup context, relational disruption is particularly consequential when it involves the founders as the primary knowledge sources and decision makers of the startup (Gedajlovic *et al.*, 2004; Zahra and Filatotchev, 2004). Accordingly, employees will be more likely to leave a startup when the introduction of dedicated managers keeps them from learning directly from founders and influencing their decision-making. Our empirical study supports this hypothesis and demonstrates that the magnitude of the effect is substantial. Subsequently, we show that the effects are stronger for employees who are early in their careers and particularly likely to value direct founder access as a learning opportunity as well as when founding teams are small and the loss of influence on startup decision-making after delegation is most immediate. The results for these moderating factors support the presence of both main mechanisms, i.e., loss of knowledge access and loss of influence, which are central to our theorizing for retention effects.

Overall, the insights from our research have consequences for two streams of research. First, threshold models explaining startup life cycles (Gedajlovic *et al.*, 2004; Zahra and Filatotchev, 2004) are incomplete when they do not account for potentially adverse effects when startups professionalize. Within our logic, the delegation of decision authority from founders to dedicated managers might be necessary to address the attention overload of founders (Gifford, 1992) but reduces the attractiveness of a startup as a workplace. Hence, an increasingly complete theory of startup professionalization needs to incorporate both the benefits as well as the adverse effects when startups loose parts of their distinctiveness as workplaces. We focus on the delegation of decision-making authority by founders but other organizational design choices are likely to have similar employment effects and make startups increasingly similar to any other workplace. Hence, other organizational design choices could be useful extensions of our theoretical model.

For example, the emergence of functional departments with dedicated, specialized tasks is equally likely to conflict with the specific utility that employees obtain when working for a startup because they affect workplace relationships and knowledge access (Brennecke *et al.*, 2021). More generally, startups are a fitting laboratory to study the retention effects of organizational design choices in general because they start from flat hierarchies and flexible task allocation.

Second, while most entrepreneurship research focusses on founder characteristics, the presence of skilled employees is a crucial factor for startup success (Clough *et al.*, 2018; Grillitsch *et al.*, 2019). Major instruments of startups for recruiting employees are typically attractive work conditions that can compensate for comparatively lower salaries (Sorenson *et al.*, 2021). However, we know little about distinct mechanisms by which startups retain or loose employees. This shortcoming limits the applicability of entrepreneurship theory describing strategic human capital strategies of startups because it rests on the unrealistic assumption that startup employees do not have other job opportunities on labor markets. Our theoretical model alleviates this strong assumption by explicating how direct access to founders makes startups distinct as attractive employers and this distinctness can be lost once founders start delegation. What is more, we highlight heterogeneity among startup employees, i.e., the stage of their professional career, and how they react to losing the unmitigated access to founders. A logical next step in developing our theory further could be to incorporate the personality traits of employees and to analyze how their personality shapes their sensitivity towards the professionalization of the startup that they are working for and their decisions on future career moves.

These implications for scientific research are mirrored in practical repercussions for startup

founders. From a founder's perspective, it is important to understand the adverse effects of delegation on employee retention. As a consequence, founders can mitigate negative effects by preparing the startup workforce for any changes. Founders may want to reassure employees that they will be available for mentoring and discussing startup strategy even after dedicated managers have taken over some decision-making. Separately, founders could be better off when they identify employees who represent the most critical human capital of the startup ahead of any changes in decision-making authority. This selected group of employees should remain in close contact with founders after delegation since their retention is most crucial for startup success.

LIMITATIONS AND CONCLUSIONS

We set boundaries for the scope of our research project to ensure that it can be implemented in a single article. However, future studies may go beyond these limitations of our study as fruitful pathways for further research. These opportunities occur in three broad categories.

First, we benefit from a broad sample of startup employees for testing our hypotheses. However, we cannot observe the decision of employees to stay or leave their startup directly, nor can we trace the information that they take into account and how they weigh it. Future studies may rely on experimental or qualitative research designs which focus less on whether retention effects exist but rather how they emerge.

Second, we apply a variety of panel and instrumental variable estimation approaches to eliminate potentially endogenous effects from a startup's decision to delegate decision-making authority to dedicated managers. All of these approaches yield consistent results. However, an ideal setting for establishing causality could leverage additional exogenous sources of variation, such as changes in regulatory requirements for startup management. These do not occur during

our observation period in Germany but future studies may be able to exploit them in other settings.

Third, our empirical study is limited to the context of Germany, arguably a country with well-developed institutions and labor markets similar to many other developed countries. However, whether the hypothesized relationships would also hold in developing countries is not ex-ante clear since employees might be less likely to switch jobs when they face inefficient labor markets or even prefer employers with increasingly stable decision-making through delegation. Comparative studies might be able to integrate such country-level mechanisms into our theory.

In closing, we explore the changing nature of startups as attractive workplaces when they professionalize. While professionalization is a necessary step in the lifecycle of any startup, we highlight that there are adverse effects that require rethinking about what makes startups distinctively attractive workplaces in the first place and whether a certain level of personnel turnover is unavoidable when startups grow and founders need to delegate decision-making. Our study is a first step into following this evolution of startups as workplaces during their lifecycle phases.

REFERENCES

Acs ZJ, Gifford S. 1996. Innovation of Entrepreneurial Firms. *Small Business Economics* **8**(3): 203-218.

Agarwal R. 2019. Human Enterprise. In AJ Nyberg, TP Moliterno (Eds.), *Handbook of Research on Strategic Human Capital Resources*. Edward Elgar Publishing: Cheltenham, UK.

Baek M, Bidwell M, Keller JR. 2021. My Manager Moved! Manager Mobility and Subordinates' Career Outcomes. *Organization Science* **forthcoming**

Baron J, Hannan M, Burton MD. 2001. Labor Pains: Change in Organizational Models and Employee Turnover in Young, High-Tech Firms. *American Journal of Sociology* **106**(4): 960-1012.

Baron JN, Burton MD, Hannan MT. 1999. Engineering Bureaucracy: The Genesis of Formal Policies, Positions, and Structures in High-Technology Firms. *Journal of Law, Economics and Organization* **15**(1): 1-41.

Becker GS. 1962. Investment in Human Capital: A Theoretical Analysis. *Journal of Political Economy* **70**(5): 9-49.

Bidwell M, Fernandez-Mateo I. 2010. Relationship Duration and Returns to Brokerage in the Staffing Sector. *Organization Science* **21**(6): 1141-1158.

Boeker W, Karichalil R. 2002. Entrepreneurial Transitions: Factors Influencing Founder Departure. *Academy of Management Journal* **45**(4): 818-826.

Brennecke J, Sofka W, Wang P, Rank ON. 2021. How the Organizational Design of R&D Units Affects Individual Search Intensity – a Network Study. *Research Policy* **50**(5): 1-14.

Briscoe F, Rogan M. 2015. Coordinating Complex Work: Knowledge Networks, Partner Departures, and Client Relationship Performance in a Law Firm. *Management Science* **62**(8): 2392-2411.

Campbell BA. 2013. Earnings Effects of Entrepreneurial Experience: Evidence from the Semiconductor Industry. *Management Science* **59**(2): 286-304.

Campbell BA, Ganco M, Franco AM, Agarwal R. 2012. Who Leaves, Where to, and Why Worry? Employee Mobility, Entrepreneurship and Effects on Source Firm Performance. *Strategic Management Journal* **33**(1): 65-87.

Clough DR, Fang TP, Vissa B, Wu A. 2018. Turning Lead into Gold: How Do Entrepreneurs Mobilize Resources to Exploit Opportunities? *Academy of Management Annals* **13**(1): 240-271.

Colombo MG, Grilli L. 2013. The Creation of a Middle-Management Level by Entrepreneurial Ventures: Testing Economic Theories of Organizational Design. *Journal of Economics & Management Strategy* **22**(2): 390-422.

Czarnitzki D, Doherr T, Hussinger K, Schliessler P, Toole AA. 2015. Individual Versus Institutional Ownership of University-Discovered Inventions. *ZEW-Centre for European Economic Research Discussion Paper*(15-007)

Daily CM, Dalton DR. 1992. Financial Performance of Founder-Managed Versus Professionally Managed Small Corporations. *Journal of small business management* **30**(2): 25-34.

Dencker JC, Gruber M. 2015. The Effects of Opportunities and Founder Experience on New Firm Performance. *Strategic Management Journal* **36**(7): 1035-1052.

Fryges H, Gottschalk S, Kohn K. 2009. The Kfw/Zew Start-up Panel: Design and Research Potential. *Schmollers Jahrbuch/Journal of Applied Social Sciences Studies* **130**(1): 117-131.

Garicano L. 2000. Hierarchies and the Organization of Knowledge in Production. *Journal of Political Economy* **108**(5): 874-904.
Gedajlovic E, Lubatkin MH, Schulze WS. 2004. Crossing the Threshold from Founder Management to Professional Management: A Governance Perspective. *Journal of Management Studies* **41**(5): 899-912.
Gifford S. 1992. Allocation of Entrepreneurial Attention. *Journal of Economic Behavior & Organization* **19**(3): 265-284.
Granovetter M. 1992. Problems of Explanation in Economic Sociology. In N Nohria, RG Eccles (Eds.), *Networks and Organizations: Structure, Form, and Action*. Harvard Business School Press: Boston: 25-56.
Grillitsch M, Schubert T. 2021. Does the Timing of Integrating New Skills Affect Start-up Growth? *Strategic Entrepreneurship Journal* **15**(4): 647-684.
Grillitsch M, Schubert T, Srholec M. 2019. Knowledge Base Combinations and Firm Growth. *Research Policy* **48**(1): 234-247.
Grimpe C, Murmann M, Sofka W. 2019. Organizational Design Choices of High-Tech Startups – How Middle Management Drives Innovation Performance. *Strategic Entrepreneurship Journal* **13**(3): 359-378.
Harris M, Raviv A. 2002. Organization Design. *Management Science* **48**(7): 852-865.
Hashai N, Zahra S. 2021. Founder Team Prior Work Experience: An Asset or a Liability for Startup Growth? *Strategic Entrepreneurship Journal* **forthcoming**
Hellmann T, Puri M. 2002. Venture Capital and the Professionalization of Start-up Firms: Empirical Evidence. *The Journal of Finance* **57**(1): 169-197.
Kryscynski D, Coff R, Campbell B. 2020. Charting a Path between Firm-Specific Incentives and Human Capital-Based Competitive Advantage. *Strategic Management Journal* **forthcoming**
Lazar M, Miron-Spektor E, Agarwal R, Erez M, Goldfarb B, Chen G. 2019. Entrepreneurial Team Formation. *Academy of Management Annals* **14**(1): 29-59.
Lazear Edward P. 2005. Entrepreneurship. *Journal of Labor Economics* **23**(4): 649-680.
Leung A, Der Foo M, Chaturvedi S. 2013. Imprinting Effects of Founding Core Teams on Hr Values in New Ventures. *Entrepreneurship Theory and Practice* **37**(1): 87-106.
McAllister DJ. 1995. Affect- and Cognition-Based Trust as Foundations for Interpersonal Cooperation in Organizations. *Academy of Management Journal* **38**(1): 24-59.
Murmann M. 2017. The Productivity Effects of Worker Replacement in Young Firms. *ZEW - Centre for European Economic Research Discussion Paper*: Mannheim.
Nahapiet J, Ghoshal S. 1998. Social Capital, Intellectual Capital, and the Organizational Advantage. *Academy of Management Review* **23**(2): 242-266.
Nelson T. 2003. The Persistence of Founder Influence: Management, Ownership, and Performance Effects at Initial Public Offering. *Strategic Management Journal* **24**(8): 707-724.
Phillips DJ. 2002. A Genealogical Approach to Organizational Life Chances: The Parent-Progeny Transfer among Silicon Valley Law Firms, 1946-1996. *Administrative Science Quarterly* **47**(3): 474-506.
Ployhart RE, Moliterno TP. 2011. Emergence of the Human Capital Resource: A Multilevel Model. *Academy of Management Review* **36**(1): 127-150.
Radner R. 1993. The Organization of Decentralized Information Processing. *Econometrica* **61**(5): 1109-1146.

Reagans R, Argote L, Brooks D. 2005. Individual Experience and Experience Working Together: Predicting Learning Rates from Knowing Who Knows What and Knowing How to Work Together. *Management Science* **51**(6): 869-881.
Rocha V, van Praag M. 2020. Mind the Gap: The Role of Gender in Entrepreneurial Career Choice and Social Influence by Founders. *Strategic Management Journal* **41**(5): 841-866.
Sine WD, Mitsuhashi H, Kirsch DA. 2006. Revisiting Burns and Stalker: Formal Structure and New Venture Performance in Emerging Economic Sectors. *Academy of Management Journal* **49**(1): 121-132.
Sorenson O, Audia P, xa, G. 2000. The Social Structure of Entrepreneurial Activity: Geographic Concentration of Footwear Production in the United States, 1940–1989. *American Journal of Sociology* **106**(2): 424-462.
Sorenson O, Dahl MS, Canales R, Burton MD. 2021. Do Startup Employees Earn More in the Long Run? *Organization Science* **32**(3): 587-604.
Stern I, Deng X, Chen G, Gao H. 2021. The "Butterfly Effect" in Strategic Human Capital: Mitigating the Endogeneity Concern About the Relationship between Turnover and Performance1. *Strategic Management Journal* **forthcoming**
Sørensen JB. 2007. Bureaucracy and Entrepreneurship: Workplace Effects on Entrepreneurial Entry. *Administrative Science Quarterly* **52**(3): 387-412.
Vaznyte E, Andries P. 2019. Entrepreneurial Orientation and Start-Ups' External Financing. *Journal of Business Venturing* **34**(3): 439-458.
Wu CY-H, Hsu H-H. 2018. Founders and Board Structure: Evidence from Uk Ipo Firms. *International Review of Financial Analysis* **56**(March): 19-31.
Zahra SA, Filatotchev I. 2004. Governance of the Entrepreneurial Threshold Firm: A Knowledge-Based Perspective. *Journal of Management Studies* **41**(5): 885-897.
Zahra SA, Filatotchev I, Wright M. 2009. How Do Threshold Firms Sustain Corporate Entrepreneurship? The Role of Boards and Absorptive Capacity. *Journal of Business Venturing* **24**(3): 248-260.

Table 1: Details on measures

Variable	Construction
Separation from focal startup	Dummy variable – Takes value of one if an individual's employment in a focal startup ends.
Delegation of decision-making authority	Dummy variable – Takes value of one in years in which a startup has dedicated employees whose occupation codes indicate a supervisory or managerial position.
Age of employee	Age of an employee in years.
Female employee	Dummy variable – Takes value of one for female employees.
Employee is foreigner	Dummy variable – Takes value of one for employees without German nationality.
Employee with tertiary education	Dummy variable – Takes value of one if employees hold a tertiary degree.
Employee with tech background	Dummy variable - Takes value of one if employees worked in a technical occupation in their previous work history.
Employee with business background	Dummy variable - Takes value of one if employees worked in a business administration occupation in their previous work history.
Career start in focal startup	Dummy variable – Takes value of one if the employees started their career, after reaching their highest degree, in a focal startup.
Average daily income of employee	Dummy variable – Average daily wage in a year in EUR.
Wage rank of employee in firm	(Relative) rank of the employee in a firm's wage distribution (rank/no. employees).
Number of founders in team	Number of founders (in the founding team) according to the survey data.
Female founder	Dummy variable – Takes value of one if the founder (or one founder in the team) is female according to the survey data.
Founder is foreigner	Dummy variable – Takes value of one if the founder (or one founder in the team) self-reports to be of non-German national origin according to the survey data.
Founder with tertiary education	Dummy variable – Takes value of one if the founder (or one founder in the team) has a tertiary degree according to the survey data.
Founder held patents before foundation	Dummy variable – Takes value of one if the founder (or one founder in the team) held patents before starting up own company according to the survey data.
Successful prior entrepreneur	Dummy variable – Takes value of one if the founder (or one founder in the team) reported starting up an own company that was sold profitably or is still operational.
Unsuccessful prior entrepreneur	Dummy variable – Takes value of one if the founder (or one founder in the team) reported starting a company that went bankrupt or was closed for financial reasons.
Managerial experience as employee	Dummy variable – Takes value of one if the founder (or one founder in the team) reported working in a supervisory or managerial position in prior employment.
Firm age	Age of the startup in years according to the survey data.
No. of employees in firm	Full-time equivalent number of reportable employees subject to social security contributions according to the register data. Includes regular full- and part-time employees, apprentices, interns, and marginal employment.
Employment growth rate	Growth rate of the number of reportable employees according to the register data.

Table 2: Descriptive statistics

	N	Mean	SD
Separation from focal startup (y/n)	52788	0.14	0.35
Delegation of decision-making authority (y/n)	52788	0.52	0.5
Age of employee in years	52788	38.9	12.76
Female employee (y/n)	52788	0.36	0.48
Employee is foreigner (y/n)	52788	0.07	0.26
Employee with tertiary education (y/n)	52788	0.17	0.38
Employee with tech background (y/n)	52788	0.36	0.48
Employee with business background (y/n)	52788	0.23	0.42
Career start in focal startup (y/n)	52788	0.14	0.34
Tenure of employee in firm in years	52788	2.67	2.18
Av. daily income of employee in EUR	52788	91.32	80.09
Wage rank of employee in firm	52788	0.32	0.22
Number of founders in team	52788	1.7	0.94
Female founder (y/n)	52788	0.2	0.4
Founder is foreigner (y/n)	52788	0.02	0.14
Founder with tertiary education (y/n)	52788	0.52	0.5
Founder held patents before founding (y/n)	52788	0.03	0.18
Successful prior entrepreneur (y/n)	52788	0.33	0.47
Unsuccessful prior entrepreneur (y/n)	52788	0.14	0.35
Managerial experience as employee (y/n)	52788	0.57	0.5
Firm age in years	52788	5.87	2.64
No. of employees in firm	52788	51.41	130.42
Employment growth rate	52788	0.42	1.88
High-technology manufacturing (y/n)	52788	0.19	0.39
Technology-intensive services (y/n)	52788	0.15	0.36
Software supply and consultancy (y/n)	52788	0.07	0.26
Non-high-tech manufacturing (y/n)	52788	0.18	0.38
Skill-intensive services (y/n)	52788	0.03	0.18
Other business-oriented services (y/n)	52788	0.1	0.3
Consumer-oriented services in creative sectors (y/n)	52788	0.01	0.1
Consumer-oriented services (y/n)	52788	0.08	0.27
Construction (y/n)	52788	0.11	0.31
Retail & wholesale (y/n)	52788	0.08	0.27

Notes: Additional control variable: funding by KfW bank; S.D.: standard deviation; y/n: yes/no

Table 3: Pairwise correlations of dependent and main explanatory variables (n=52,788)

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1)	Separation from focal startup (y/n)	1										
(2)	Delegation of decision-making authority (y/n)	0.2672*	1									
(3)	Age of employee in years	0.0185*	-0.0322*	1								
(4)	Female employee (y/n)	-0.0280*	0.0012	0.0557*	1							
(5)	Employee is foreigner (y/n)	0.0166*	0.0435*	-0.0253*	-0.0007	1						
(6)	Employee with tertiary education (y/n)	0.0147*	0.0017	-0.0245*	-0.0144*	0.0283*	1					
(7)	Employee with tech background (y/n)	0.0285*	-0.0351*	-0.0117*	-0.3226*	-0.0584*	-0.0202*	1				
(8)	Employee with business background (y/n)	-0.0107*	-0.0128*	0.0304*	0.3544*	-0.0527*	0.0716*	-0.4027*	1			
(9)	Career start in focal startup (y/n)	0.007	0.0012	-0.4152*	-0.0669*	0.0290*	0.1478*	0.0054	-0.0138*	1		
(10)	Tenure of employee in firm in years	0.1589*	-0.0783*	0.2149*	-0.0243*	-0.0911*	-0.0137*	0.0653*	0.0338*	-0.0136*	1	
(11)	Av. daily income of employee in EUR	0.0440*	-0.0572*	0.0142*	-0.0899*	-0.0054	0.1756*	0.0331*	0.0296*	0.0027	0.0964*	1
(12)	Wage rank of employee in firm	-0.1969*	-0.1711*	0.0404*	-0.0903*	-0.0566*	0.0985*	0.1072*	0.0016	-0.0546*	0.0007	0.3419*
(13)	Number of founders in team	0.0366*	-0.0046	-0.0540*	-0.0207*	-0.0163*	0.1716*	-0.0254*	0.0412*	0.0745*	0.0073*	0.0840*
(14)	Female founder (y/n)	0.0518*	0.0339*	0.0258*	0.0197*	-0.0323*	-0.0247*	0.0250*	-0.0343*	-0.0204*	-0.0566*	-0.0473*
(15)	Founder is foreigner (y/n)	-0.0008	0.0246*	-0.0145*	-0.0078*	0.4396*	0.0244*	-0.0343*	-0.0045	0.0136*	-0.0463*	0.0057
(16)	Founder with tertiary education (y/n)	0.0776*	0.0192*	-0.0363*	-0.0310*	0.0249*	0.2503*	-0.0327*	0.0713*	0.0627*	-0.0493*	0.0908*
(17)	Founder held patents before founding (y/n)	0.0161*	0.0045	0.0187*	0.0168*	-0.0100*	0.0406*	0.0196*	0.0037	-0.0114*	-0.0007	0.0372*
(18)	Successful prior entrepreneur (y/n)	0.0598*	0.0110*	0.0105*	0.0400*	-0.0083*	0.1036*	-0.0147*	0.0640*	0.0213*	0.0142*	0.0574*
(19)	Unsuccessful prior entrepreneur (y/n)	-0.0252*	0.0101*	-0.0260*	-0.0089*	0.0209*	0.0384*	-0.0581*	0.0039	0.0168*	-0.0225*	0.007
(20)	Managerial experience as employee (y/n)	0.0022	-0.0106*	0.0092*	-0.0545*	-0.0226*	0.0127*	0.0872*	-0.0428*	-0.0052	0.0233*	0.0024
(21)	Firm age in years	0.2116*	0.0959*	0.1112*	0.0112*	-0.0290*	-0.0175*	0.0285*	0.0044	0.0313*	0.5062*	0.0262*
(22)	No. of employees in firm	0.1526*	0.0783*	-0.0003	-0.0909*	0.0862*	-0.0547*	0.0822*	-0.0784*	-0.0072*	-0.0452*	-0.0435*
(23)	Employment growth rate	-0.0301*	-0.0201*	-0.0369*	-0.0054	0.0151*	0.0188*	-0.005	0.0165*	0.0012	-0.1411*	0.0089*

		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
(12)	Wage rank of employee in firm	1										
(13)	Number of founders in team	-0.0128*	1									
(14)	Female founder (y/n)	-0.0351*	0.1615*	1								
(15)	Founder is foreigner (y/n)	-0.0242*	0.0213*	-0.0007	1							
(16)	Founder with tertiary education (y/n)	-0.0437*	0.2875*	0.0838*	-0.0113*	1						
(17)	Founder held patents before founding (y/n)	-0.0015	0.0117*	-0.0096*	-0.0151*	0.0572*	1					
(18)	Successful prior entrepreneur (y/n)	-0.001	0.2005*	0.0131*	0.0100*	0.1305*	0.0841*	1				
(19)	Unsuccessful prior entrepreneur (y/n)	-0.0023	0.1305*	-0.0466*	0.0191*	0.0042	-0.0330*	-0.0894*	1			
(20)	Managerial experience as employee (y/n)	-0.0062	0.0355*	0.0027	-0.0350*	0.0730*	-0.0264*	-0.2111*	-0.0696*	1		
(21)	Firm age in years	-0.1111*	-0.0206*	0.0164*	-0.0410*	-0.0284*	-0.0283*	-0.0293*	-0.0187*	0.0071	1	
(22)	No. of employees in firm	-0.1514*	-0.1278*	0.2455*	-0.0186*	0.1846*	-0.0423*	-0.1344*	-0.0813*	0.1342*	0.1180*	1
(23)	Emplyoment growth rate	-0.0266*	0.0323*	0.0036	0.0158*	0.0190*	0.0088*	0.0038	0.0013	-0.005	-0.1788*	-0.0081*

Notes: * denotes the statistical significance of a pairwise correlation at a 10% level; y/n: yes/no.

Table 4: Preliminary estimation results

Dependent variable: Likelihood to leave startup	A Cox PH Coef. (S.E.)	B FE Poisson Coef. (S.E.)	C IV regression Coef. (S.E.)	D Cox PH Coef. (S.E.)	E Cox PH Coef. (S.E.)	F Cox PH Coef. (S.E.)
Delegation of decision-making authority (y/n)	1.505 (0.036)***	0.001 (0.000)***	0.160 (0.045)***	2.087 (0.106)***	1.476 (0.038)***	1.716 (0.068)***
Delegation * Age of employee in years				-0.015 (0.003)***		
Delegation * Career start in focal startup					0.222 (0.101)**	
Delegation * Number of founders in team						-0.125 (0.034)***
Age of employee in years	-0.006 (0.001)***	-0.005 (0.000)***	0.000 (0.000)**	0.007 (0.002)***	-0.006 (0.001)***	-0.006 (0.001)***
Female employee (y/n)	-0.115 (0.026)***		0.001 (0.002)	-0.115 (0.026)***	-0.116 (0.026)***	-0.115 (0.026)***
Employee is foreigner (y/n)	0.114 (0.043)***	-0.000 (0.000)	-0.004 (0.004)	0.112 (0.043)***	0.114 (0.043)***	0.114 (0.043)***
Employee with tertiary education (y/n)	0.109 (0.033)***	-0.000 (0.000)	0.002 (0.003)	0.108 (0.033)***	0.107 (0.033)***	0.110 (0.033)***
Employee with technology background (y/n)	-0.119 (0.029)***	-0.000 (0.000)	-0.012 (0.002)***	-0.119 (0.029)***	-0.119 (0.029)***	-0.119 (0.029)***
Employee with business background (y/n)	-0.047 (0.032)	-0.000 (0.000)	-0.004 (0.002)	-0.047 (0.032)	-0.047 (0.032)	-0.047 (0.032)
Career start in focal startup (y/n)	-0.171 (0.035)***		-0.002 (0.003)	-0.170 (0.035)***	-0.361 (0.091)***	-0.170 (0.035)***
Tenure of employee in firm in years	-0.239 (0.007)***	-0.000 (0.000)***	0.003 (0.001)***	-0.239 (0.007)***	-0.239 (0.007)***	-0.239 (0.007)***
Av. daily income of employee	-0.001 (0.000)***	0.000 (0.000)***	-0.000 (0.000)**	-0.001 (0.000)***	-0.001 (0.000)***	-0.001 (0.000)***
Relative wage rank of employee in firm	-1.815 (0.081)***	-0.000 (0.000)	0.000 (0.020)	-1.821 (0.081)***	-1.818 (0.081)***	-1.823 (0.081)***
Number of founders in team	-0.044 (0.014)***		-0.001 (0.001)	-0.044 (0.014)***	-0.044 (0.014)***	0.062 (0.029)**
Female founder (y/n)	0.006 (0.031)		-0.005 (0.003)**	0.009 (0.031)	0.006 (0.031)	0.006 (0.031)
Founder is foreigner (y/n)	0.151 (0.077)**	-0.000 (0.000)	0.019 (0.008)**	0.152 (0.077)**	0.149 (0.077)*	0.149 (0.077)*
Founder with tertiary education (y/n)	-0.035 (0.027)		-0.013 (0.002)***	-0.035 (0.027)	-0.034 (0.027)	-0.034 (0.027)
Founder held patents before founding (y/n)	0.177 (0.062)***		-0.003 (0.005)	0.181 (0.062)***	0.177 (0.062)***	0.171 (0.062)***
Successful prior entrepreneur (y/n)	0.023 (0.026)		-0.002 (0.003)	0.023 (0.026)	0.023 (0.026)	0.025 (0.026)
Unsuccessful prior entrepreneur (y/n)	0.104 (0.032)***		0.005 (0.003)*	0.102 (0.032)***	0.103 (0.032)***	0.104 (0.032)***
Managerial experience as employee (y/n)	-0.055 (0.024)**		-0.000 (0.002)	-0.056 (0.024)**	-0.056 (0.024)**	-0.057 (0.024)**
Firm age in years	0.096 (0.005)***	0.005 (0.000)***	0.003 (0.001)***	0.096 (0.005)***	0.096 (0.005)***	0.096 (0.005)***
No. of employees in firm	-0.001 (0.000)***	0.000 (0.000)**	-0.000 (0.000)	-0.001 (0.000)***	-0.001 (0.000)***	-0.001 (0.000)***
Employment growth rate	-0.030 (0.026)	-0.000 (0.000)***	-0.006 (0.001)***	-0.031 (0.026)	-0.030 (0.026)	-0.030 (0.026)
Industry FE and Constant	Yes	No	Yes	Yes	Yes	Yes
N / R-sq.	52788	50642	52788 / 0.062	52788	52788	52788

Notes: Coefficients from Cox proportional hazard models (columns A and D-F), individual-level fixed-effect Poisson models (column B, effect sizes not comparable as dependent variable was rescaled to achieve converging estimates), and linear Instrumental Variables models (column C). Significance levels: *** 1%, ** 5%, * 10%. Cluster-robust standard errors in parentheses. Additional control variables in all regressions: Funding by KfW bank.