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Kin ties and the performance of new firms: A structural approach

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ABSTRACT

Kin ties are all but ubiquitous in new firms. However, their effects on performance are not straightforward, because they may provide new firms with advantages (enhanced coordination and cooperation) as well as disadvantages (reduced diversity, nepotism concerns, and the possible spillover of personal conflict). As kin ties may have both positive and negative implications for performance, a contingency approach to the performance of new firms is valuable. We develop such an approach by relating different structural configurations of kin ties – whether they are between founders, between founders and employees, and between employees – to the performance of new firms. We test our predictions using data on 4,967 new firms founded in Stockholm between 1998 and 2003. Our theory deepens our understanding of why kin ties have heterogeneous effects on the performance of new firms.

"I strongly advise against it and shy away from deals where the teams are too tightly knit on the personal side. Blood [family relationships] is almost always a show-stopper."
Paul McManus, a member of a Boston venture capital firm, as quoted in Wasserman (2012: 100).

INTRODUCTION

We develop a contingency approach to study the performance of new firms, which distinguishes between different structural configurations of kin ties based on whether they are between founders, between founders and employees, or between employees. Such a contingency approach is necessary because kin ties may be advantageous (due to enhanced coordination and cooperation) or disadvantageous (due to reduced diversity, nepotism concerns, and the possible spillover of personal conflict) to a new firm, making their performance effects non-conclusive or ambiguous. Advancing theory on the consequences of the extent of kin ties in new firms is also important because kin constitute one the largest systematic sources of initial members (founders or employees) of new firms (Zimmer & Aldrich, 1987; Ruef, 2010), and the backgrounds of initial members affect the survival and sales of new firms (Beckman, 2006; Burton & Beckman, 2007; Beckman & Burton, 2008). Our contingency approach builds on the perspectives which have argued that entrepreneurship is mostly embedded in family relationships and that these relationships are thus likely to be important to the performance of new firms (Aldrich & Cliff, 2003; Aldrich 1999).

Given that kin figure prominently among the initial members of new firms (Ruef, 2010) and initial members have a major effect on new firms' performance, how do kin ties influence the performance of new firms? Previous studies with a bearing on this question report mixed results. Some have found that kin ties in an entrepreneur's network enhance new firm performance (Bruderl & Preisendorfer, 1998; Cruz et al., 2012; Powell & Eddleston, 2017); others report a negative effect (Mozumdar et al., 2019; Yu, Tao, Chen,

Zhang, & Xu, 2019; Valdez, 2008); and other studies find no effect in either direction (Arregle et al., 2015; Santarelli & Tran, 2013; Davidsson & Honig, 2003).

We suggest that these mixed findings may arise from inadequate consideration of how the multiple mechanisms that underlie the effects of kin within new firms jointly influence performance. On the one hand, compared with non-relatives, kin have more information about each other's skills and capabilities and can coordinate better. They may also find it easier to cooperate with each other. We expect these factors to benefit new firms. On the other hand, however, kin ties may also reduce diversity and access to novel information within new firms, due to the overlap of networks, and raise nepotism-related concerns among non-kin members of the new firm. Therefore, there is a need for a contingency explanation that focuses on the conditions under which the positive or negative mechanisms are predominant. In addition, because the performance of new firms is a topic of considerable practical importance, a theoretical perspective that subsumes the mixed findings of the previous literature and indicates when kin ties may have positive, negative, or no effects on the performance of new firms will have valuable practical implications.

Our approach focuses on the structures created by kin ties within and across hierarchical levels of an organization (see also Fernandez & Weinberg, 1997; Fernandez et al., 2000; Castilla, 2011). We develop a structural theory and derive predictions as to how kin ties (1) between founders, (2) between founders and employees, and (3) between employees are related to the performance of new firms. Our approach shows that some structures are likely to enable the positive mechanisms tied to kin while constraining the negative mechanisms, thereby jointly improving the performance of new firms. Other structures are likely to amplify the negative mechanisms associated with kin ties, adversely affecting the performance of new firms. Finally, for some other structures yet, no clear *a priori* predictions can be made, because the joint effects of the positive and negative mechanisms are

ambiguous. Our approach offers a way of reconciling the mixed results of the literature and thereby facilitating the accumulation of more coherent evidence going forward.

We use detailed data on adults who resided in Stockholm County, Sweden between 1990 and 2003, along with data on 4,967 new firms founded in Stockholm between 1998 and 2003, to test our predictions about new firm performance. We conclude with a discussion of the implications of our framework and results for entrepreneurship theory and practice.

In addition to advancing theory, our perspective challenges the notiong that may be held by many educators and mentors of entrepreneurs that the prevalence of kin in a new firm is detrimental to its performance. Due to the general emphasis on the logic of meritocracy, according to which individuals are recruited and remunerated based on their task competence (Castilla & Benard, 2010), researchers may have overlooked the implications of the resource and information constraints under which entrepreneurs recruit members for new firms. Given such constraints, kin ties may not in fact be detrimental to performance. This is important, as kin constitute the most common source of members for a new firm (Ruef, 2010). By introducing more nuanced guidelines for the practice of entrepreneurship, based on the contingencies we articulate, our structural approach provides a conceptual framework that advises against simplistic or unconditional statements about the performance effects of the extent of kin ties in new firms.

LITERATURE REVIEW AND THEORY DEVELOPMENT

Social Ties in New Firms

New firms are beset with the liability of newness (Stinchcombe, 1965), a lack of well-defined roles (Miner, 1991), and a lack of established routines and practices. As a result, coordination and cooperation are particularly challenging for new firms (Aldrich, 1999). Organizational sociologists use the structures created by social ties between members to explain coordination and cooperation within organizations (Coleman, 1988). When studying

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new firms, the ties created by kin constitute a particularly relevant structural dimension (Aldrich, 1999; Ruef, 2010). Aldrich (1999) suggests that most of the initial resource contributors to new firms do not make transaction-specific cost-benefit calculations. As a result, initial contributors who feel an "affective tug" or are in a reciprocal relationship with the entrepreneur are more likely to come to the entrepreneur's aid. Unsurprisingly, given their resource constraints and the information asymmetries they face, most entrepreneurs rely on their kin as co-founders and initial employees (Aldrich, 1999; Ruef et al., 2003; Vissa, 2011).[1]

However, entrepreneurs' reliance on kin creates a performance trade-off for their new firms. Relying upon kin as co-founders and employees may reduce information asymmetry and conflict and enhance cooperation (Aldrich, 1999; Ruef, 2010), which we refer to collectively as *coordination and cooperation benefits.* Kin ties allow entrepreneurs to access private information about the suitability of a potential co-founder or employee for a given job or role. Therefore, after recruiting a new firm member who is kin, such detailed private information may be useful in the division and assignment of tasks. New firms tend to have higher levels of role ambiguity (Miner, 1991), and role ambiguity may lead to conflict among members (Rizzo, House, & Lirtzman, 1970). Kin ties may reduce such conflict, as kin ties allow for richer communication that may nip conflict in the bud or resolve it more effectively. Nelson (1989) finds that compared with their high-conflict counterparts, low-

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[1] Evidence supporting the claim that entrepreneurs rely on kin as co-founders, i.e., founding teams, is provided in nationally representative studies in the U.S. and surveys of nascent entrepreneurs in other countries. Nascent entrepreneurs are individuals engaged in the creation of new businesses, either by themselves or in partnership with other individuals. As nearly 72 percent of nascent ventures in the U.S. are not formally registered, reliance on kin ties in nascent venture samples may be greater than that in samples of formally registered firms. In the U.S., 53.3 percent of nascent entrepreneurs had kin ties with other founders (Ruef, 2010), and in 30 percent of the firms, founders with kin ties outnumbered founders without kin ties (Matthews et al., 2012). Using data from Australia, Davidsson and colleagues (2008) find that spouses or other *de facto* couples account for more than half of multi-member nascent ventures. A study from Canada reports that 44 percent of all nascent ventures consisted of more than one person, and of these ventures, 26 percent were founded by spousal teams (Diochon et al., 2011). A Swedish study finds that of nascent ventures involving two or more people, 26 percent were run by spousal pairs, and 59.8 percent had some kin ties (Samuelsson, 2011). In summary, nascent entrepreneurs appear to rely heavily on kin as initial firm members.

conflict organizations are characterized by stronger intergroup ties, measured in terms of more frequent contact. We suggest that kin ties enable the kinds of frequent contact associated with lower conflict. Additionally, if members lack the knowledge necessary to complete a task, they are more likely to receive help from kin than non-kin members (Nowak, 2006). Entrepreneurs' strong social ties, such as kin ties, have also been linked with greater resources, contacts, and support (Jack, 2005). Additionally, ties that contribute many types of resources are viewed as particularly valuable by entrepreneurs (Grossman, Yli-Renko, & Janakiraman, 2012).

Although kin ties within firms are likely to enhance coordination and cooperation, they may also curtail access to *diverse* sources of information. As the social networks of kin are likely to overlap to a greater extent than those of non-kin, the information available to a kin-reliant (versus non-kin-reliant) entrepreneur is likely to be less novel or diverse (Aldrich, 1999; Aldrich & Kim, 2007). Such reduced diversity, or lack of unique information sources, appears to lower the chances of individuals entering into entrepreneurship, presumably because individuals with more kin ties in their networks do not have as novel business ideas (Renzulli, Aldrich, & Moody, 2000; Xu & Lu, 2017). Similarly, conditional on entering entrepreneurship, the extent of kin ties in a new firm may constrain the firm's development of novel business ideas or solutions. The extrapolation that the degree of involvement of kin in a new firm may be negatively related to growth and profitability is found in work on Asian entrepreneurs in the U.S. (Bates, 1994), new handicraft businesses established by female entrepreneurs in Bangladesh (Mozumdar et al., 2019), and new firms in China's largest online marketplace (Yu et al., 2019).

Kin ties may not only reduce access to diverse information and unique resources due to overlap or redundancy, but also raise concerns of nepotism and might reduce the overall solidarity of members of the new firm. In a longitudinal case study, Karra, Tracy, and Philips

(2006) report that kin ties led to the hiring of unqualified persons, and to shirking by some members with kin ties to the founder. More generally, those who are hired into a firm based on kin ties may be viewed unfavorably by others in the firm, based on the assumption that they secured their jobs unfairly, through family connections (Padgett & Morris, 2005). It has also been noted that when firms hire kin, they sometimes overlook more qualified candidates (Vinton, 1998). Hence, the degree of kin ties in a new firm may cause non-kin members to harbor doubts as to whether they will be treated fairly. In these ways, nepotism concerns may negatively influence the performance of new firms.

To summarize, four broad mechanisms may link the extent of kin ties in new firms with the firms' performance: (i) information asymmetry, (ii) cooperation and conflict, (iii) diversity, and (iv) nepotism. Some of these mechanisms have positive implications for performance, whereas others have negative implications. The theoretical understanding that kin ties can influence the performance of firms through multiple pathways is also made in the literature on established firms (Webb, Ketchen, & Ireland, 2010). A related insight is that the mechanisms and pathways by which kin influence performance differ between older firms and new firms. More specifically, Karra, Tracy, and Philips (2006) suggest that in the early stages of a new firm kin may act "altruistically," whereas in later stages, as the firm grows, kin may "shirk." As a result, there is a clear need to develop a theoretical contingency framework tailored to new firms, to which kin are particularly important.

The Literature on Kin Ties and New Firm Performance

In this section, we review the relatively small body of empirical studies that examine the effect of kin ties on new firm performance or the performance of small firms more generally. Table 1 provides an illustrative summary of our review.

Insert Table 1 here

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Some of these studies find that kin has positive effects on performance; some find negative effects; and some find no effects at all. First, Bruderl and Preisendorfer (1998) report that network support increases the survival and growth of new firms in Germany. Studies of small and medium-sized enterprises (SMEs), which are not exclusively new firms, in the Dominican Republic (Cruz et al., 2012) and the U.S. (Powell & Eddleston, 2017) report that the presence of kin employees enhances sales growth and business performance, respectively. Second, some studies find that the involvement of kin is negatively related to performance. For example, Mozumdar and colleagues (2019) analyze a sample of 292 women entrepreneurs operating in a developing country, and find that over-dependence on family impairs performance. Similarly, Yu and colleagues (2019) find that dependence on family by digital entrepreneurs in China is negatively related to performance. In a process study of new firms with implications for performance, Karra, Tracy, and Philips (2006) find that kin are more likely than non-kin to shirk responsibilities, which negatively influences the firm's culture of cooperation. Finally, studies in the third category find that the involvement of kin does not affect performance. For example, Santarelli and Tran (2013) find no support for the hypothesis that reliance on family and friends (for loans and guarantees) improves the performance of new firms. Similarly, Arregle and colleagues (2015) find no support for their hypothesized inverted U-shaped relationship between the percentage of kin in the founder's business advice network and the growth of new firms. Davidsson and Honig (2003) find that the presence of family members who own businesses, or founders who are encouraged by family and friends, has no influence on the sales of the new firm.

As this summary suggests, there is no consensus on the influence of kin ties in new firms on the performance of new firms. Compounding the difficulty of inferring the effects of kin ties on new firm performance is the frequent aggregation of family (i.e., kin) and friends into a single category denoting close social ties (Bruderl & Preisendorfer, 1998; Santarelli &

Tran, 2013). Furthermore, rather than explicitly investigating the effect of kin in a new firm on the firm's performance, many studies investigate the influence of kin in the entrepreneur's network more generally on such performance (Davidsson & Honig, 2003; Arregle et al., 2015). Cruz and colleagues (2012) and Powell and Eddleston (2017) represent exceptions to this and study how the employment of kin in small and medium firms (SMEs) affects the performance of these firms. However, both of these studies focus on SMEs, which may contain some new firms, but where a predominant part of the samples may, in fact, not be new firms. As the influence of kin varies between new and more established firms (Karra, Tracy, & Philips, 2006), and as the existing literature reports inconsistent findings, it is necessary to develop a theoretical framework for analysis of the performance-related implications of kin in new firms.

A Structural Theory of Kin Ties in New Firms

We draw on the organizational literature that builds on Barnard's (1938) insights and focuses on the network of informal connections that are important conduits for the information required for organizations' decision-making and cooperation (e.g., Selznick, 1948; McAllister, 1995). These informal networks may complement or supplement formal organizational structures (e.g., Tsai, 2002; Gargiulo, Ertug, & Galunic, 2009). Informal structures are especially important to new firms, which typically lack well-established routines for and practices of decision-making (Sine, Mitsuhashi, & Kirsch, 2006). The consideration and incorporation of kin, and in particular the informal structures created by their positions in the organizational hierarchy of new firms, is pertinent because kin ties constitute the largest group of systematic social relations in a new firm (Ruef, 2010).

Using the formal organizational structure as a template, researchers present typologies based on how ties connect members of an organization within the management level or between the management and employees (Fernandez & Weinberg, 1997; Fernandez et al.,

2000). In some of these studies, a vertical tie is used to denote a relationship between a manager and an employee, whereas a horizontal tie denotes a relationship between managers (Castilla, 2011). Work in this area considers the effects of employee recruitment as based on social ties (Breaugh, 2013), and finds that such referral-based recruitment leads to lower employee turnover (Castilla, 2005) and more positive employee evaluations (Bidwell et al., 2013). This implies that recruitment based on social ties produces outcomes that are beneficial to the performance of the organization.

We refine this structural perspective and adapt it to the study of kin in new firms. Our refinement and adaptation take the form of the following two changes, as driven by the characteristics of new firms, which are the focus of our study.

First, in adapting the structural perspective to develop our conceptual framework, we consider ties between employees as a separate type of horizontal tie (between members at the same hierarchical level). In previous research, ties between employees (as opposed to ties between managers and employees, or between managers only) are not considered extensively from the structural perspective (see Fernandez & Sosa, 2005 for a review). We consider this type of tie because in new firms, kin ties between employees can significantly alter the overall proportion of kin ties, and therefore have important implications for firm performance. By considering these structures, we can also better account for the structural contingencies that influence the relative prevalence of the advantageous and disadvantageous mechanisms underlying the effects of kin ties on the performance of new firms.

Second, our conceptual framework considers the role of high-powered incentives in reducing conflict and fostering cooperation. Whereas researchers who use the structural perspective mainly focus on firms that are neither small nor new (in which managers and owners are more likely to be segregated), the founders of new firms are often both their managers and their significant owners. Therefore, high-powered incentives, which are more

pertinent at certain levels of the organizational hierarchy (e.g., for founders) than others (e.g., for employees), may substitute for the mechanisms underlying kin ties in new firms, as we discuss further below.

As a result, our framework enables us to investigate whether and how the locations of kin ties – whether between founders ("horizontal founder kin ties"), between initial employees ("horizontal employee kin ties"), or between a founder and an initial employee ("vertical founder–employee kin ties") – have different implications for the performance of new firms. We detail this framework in the following section, in which we develop arguments about how the three structures of kin ties (horizontal founder, horizontal employee, and vertical founder–employee) serve as conduits for the abovementioned four mechanisms (information asymmetry reduction, cooperation and coordination, lack of diverse information, and nepotism concerns) in different ways and to different degrees. This leads to our divergent predictions about the performance of new firms as a function of the extent of kin ties.

Insert Figure 1 here

Contingent Effect of Kin Ties by Location

Horizontal founder kin ties: First, we expect the extent of horizontal founder kin ties in new firms to reduce asymmetry in information on the capabilities and skills of the founders (Baker & Aldrich, 1994). As a result, in situations that arise after recruitment, detailed private information may be useful in the division and assignment of tasks.

Second, in terms of cooperation, family and kin relationships generally provide an institution in which cooperation rather than conflict is the norm (Granovetter, 1985), although exceptions to this norm are always possible. Therefore, we expect to see greater cooperation between the founders of a new firm with a larger proportion of such kin ties (Karra, Tracy, & Philips, 2006). Cooperation between founders with kin ties may also influence the milieu of

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the new firm more generally. One of our interviewees explained this as follows:[2] "*I worked in such [a firm with founder–founder ties] … I am well aware that family ties, in a close family, create a special bond that is far stronger than that between two unrelated members— however close they may be. This creates a feeling of family, which then spills over to unrelated employees. However, I believe that in a well-run and thriving business there are close feelings of cooperation between all, particularly if the employees feel somewhat invested in the business themselves. The aim is to create a feeling of 'family,' even where none exists on paper.*" Another interviewee reinforced this point, saying, "*in my experience, a family business is much tighter knit, has a greater level of interaction and cooperation within the workforce, [and] is more approachable and willing to offer more assistance.*" The extent of kin ties in new firms is also related to how entrepreneurs share equity. The greater the extent of kin ties, the more equally equity is shared, which may in turn enhance cooperation (Kotha & George, 2012). The level of cooperation spillover as a function of founder–founder kin ties was also emphasized by other interviewees, as in the following case: "*I worked at a company with a founder–founder kin tie, and while the job itself wasn't great, the level of cooperation between both the founders and the employees was. There were open lines of communication between co-workers and their superiors and the founders were on the same page. There was very little in the way of interpersonal drama within the unit, with everyone looking out for each other. Everyone worked well together. It was almost as though the kin tie set an example of camaraderie for the rest of the employees.*"

However, past personal conflicts between kin may also spill over to the new firm and hamper its functioning (Webb, Ketchen, & Ireland, 2010). This issue was raised in our interviews both by founders (e.g., "*I have worked with my husband in the past. We owned the*

company, but it really took over the family life, so it would be something I would avoid") and initial employees (e.g., "*I have worked for family members before, and whilst mostly they were professional, there were times [when] their home life was brought into work and it made all [of the] employees feel uncomfortable*"). Although we acknowledge this possibility, the literature suggests that dysfunctional conflicts are less likely to arise among kin than non-kin (Granovetter, 1985). Another interviewee said, "*I worked with [a] family in my previous company. I felt that loyalty and passion were very high. Plus, there was a level of trust there—which I think makes working together more motivating.*"

Furthermore, such conflict can be assuaged by incentive alignment (Morck, Shleifer, & Vishny, 1988). Conflict between kin may occasionally flare up in a new firm, but the high-powered incentives of founders (Hellmann & Wasserman, 2016), such as equity ownership, may sufficiently motivate them to overcome such conflict. This is similar to the case of conflict between the shareholders and managers of large firms who own significant equity (Morck, Shleifer, & Vishny, 1988), particularly when the fate of a group of kin as a whole is impacted by the performance of the new firm (George et al., 2016). Hence, while greater cooperation is expected between kin than non-kin, this is not to say that there will be no negative spillover from the personal lives of the founders with kin ties to the new business. On balance, however, for the reasons discussed above, we expect the cooperation effect to dominate as a positive function of the extent of horizontal founder kin ties.

Third, in terms of the diversity of information, founders of new firms with kin ties may be at a disadvantage compared with their counterparts with no kin ties, due to the overlap in their networks (Bates, 1994; Arregle et al., 2015). In the words of one of our interviewees, "*Family members stick together, and so whether right or wrong, they will always speak with one voice.*" Hence, in new firms with more kin ties between founders,

convergence on choices may occur too quickly and unhesitatingly, as the diverse information needed to debate and propose novel solutions for the new firm may be lacking.

Fourth, regarding nepotism, it is certainly possible that horizontal founder kin ties will raise concerns among new members that they will receive fewer opportunities for career advancement. However, we suggest that conditional on joining such firms, perceptions of inequity are more likely to arise when a peer (i.e., fellow employee) is favored by superiors, rather than when superiors (i.e., founders who are kin, as in our case) favor each other (Camerer, 2003; Ho & Su, 2009; Nai, Kotha, Narayanan & Puranam, 2019). In short, such possibly damaging social comparisons are more likely to arise between (employee-level) peers. Thus, we conjecture that nepotism is unlikely to be a debilitating concern in the case considered here, in which the founders are kin, as the kin are at a higher level of the firm hierarchy than the employees. With or without kin ties, founders are already in a high position in the hierarchy, and joint action by these founders is unlikely to be viewed in terms of nepotism by the employees of the new firm, as there is no kin tie between the founders and any of the employees in this scenario.

This summary of the four mechanisms suggests that reduced information asymmetry presents a clear advantage for new firms, whereas a lack of diversity has a clear negative influence on new firms' performance. We expect cooperation to be greater, overall, for founders who are kin rather than non-kin, although this anticipated positive effect may be attenuated by the episodic negative spillover of conflict between kin. Finally, nepotism concerns are not expected to be rampant. As a result, under these circumstances, there is no clear accumulation of mechanisms that allows us to make a reasonable prediction *a priori*. Hence, we make no formal prediction regarding the effect on performance of the degree of horizontal founder kin ties in new firms.

Horizontal employee kin ties: We now discuss the same four mechanisms, i.e., (i) information asymmetry, (ii) cooperation and conflict, (iii) diversity, and (iv) nepotism concerns, to develop a prediction of the effect of the degree of kin ties between employees on the performance of new firms.

First, because roles and responsibilities in new firms are ill-defined and fluid, knowledge of an individual's capabilities and skills from prior interactions may be especially useful (Miner, 1991). An interviewee remarked that, "*I would feel more confident working for the company if I knew someone there; I could get advice on how the company works, and ask more questions before accepting the role.*" Detailed information on the skills and competencies of a member is more readily available when the member has a kin tie, and such information may enhance the assignment of tasks and division of labor, and in turn improve the performance of the new firm (Baker & Aldrich, 1994). Therefore, firms are more likely to benefit from reduced information asymmetry as a function of the degree of horizontal employee kin ties.

Second, new firms are likely to witness greater cooperation among their initial employees when they have a larger proportion of horizontal employee kin ties. New firms need contributions from employees that are difficult to anticipate *ex ante* (Aldrich, 1999). When initial employees lack the knowledge necessary to complete a task, they are more likely to receive help, clarification, or additional relevant information from another employee with whom they share a prior relationship, such as a kin tie (Breaugh & Starke, 2000). "*It might be quite fun knowing someone that's already there and knows the ropes, to help you settle in. I've worked with my sister before and it was very successful. Anything you don't know, they can correct you or guide you through the basics, which will probably settle you in easier and faster.*"

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Furthermore, bringing kin into a firm creates a supportive atmosphere, encouraging members of the new organization to shift their cognitive frames from being self-focused to being "supporters" who care about group welfare rather than just their own well-being (Aldrich & Ruef, 2006: 93). As a result, firms with more horizontal employee kin ties are likely to benefit from higher levels of cooperation. Any conflict that may arise, for example, due to role ambiguity in new firms, is also likely to be attenuated by greater kin ties among employees, because frequent and rich communication (which is more likely to occur between kin than non-kin employees) helps to ward off and resolve conflict (Nelson, 1989). Employees who are kin may occasionally experience relationship conflict, which may then spill over into the new firm, but as employees do not generally have strategic decision-making rights (and are generally easier to replace than founders), such events are unlikely to hold up the progress of the new firm. Hence, we expect that the mutual support provided by kin employees will, in general, improve coordination and cooperation.

Third, despite the coordination and cooperation benefits that accrue from kin ties, reliance on kin may curtail access to diverse sources of information. Prevalent kin ties in new firms may lead to a larger overlap in members' social networks (Ruef, 2010). Network overlap reduces the novelty or diversity of information available (Aldrich, 1999). However, the negative effect of prevalent kin ties on the ability to access diverse information may vary with the location of these ties. Founders, rather than employees, usually make the most important decisions in the early stages of new firms, so the reduced access to diverse sources of information in firms with more horizontal employee kin ties is less of a concern and less likely to impair performance. Even though information is likely to be less diverse in firms with less prevalent horizontal employee kin ties, compared with firms with no kin ties, to the extent that it is founders who make the important decisions in new firms, this reduced

diversity is unlikely to lead to appreciable differences in the information available to founders in these two types of firms.

Fourth, the prevalence of kin ties may give rise to concerns about nepotism and reduce the sense of solidarity of initial members of the new firm. Members of a new firm who do not share kin ties may be concerned that members who share kin ties will form sub-groups that control resource allocation (Brewer, 1979; Karra, Tracy, & Philips, 2006). However, we suggest that this is less problematic in the case of employee kin ties. In new firms with horizontal employee kin ties, the founders are unlikely to favor employees who are kin to each other, as they themselves have no kin ties with these employees. As a result, concerns about inequity are unlikely to arise among other employees in the new firm (Camerer, 2003; Ho & Su, 2009; Nai et al., 2019). In short, in the case of horizontal employee kin ties, concerns about nepotism are unlikely to be debilitating.

Considering the implications of the four mechanisms together suggests that kin ties between employees can benefit new firms by reducing information asymmetry and improving cooperation without raising debilitating concerns about either a lack of information diversity or nepotism. Therefore, we hypothesize that:

H1a: The prevalence of horizontal employee kin ties in new firms is associated with better performance for these firms.

Vertical founder-employee kin ties: In this scenario, as we elaborate below, the benefits of reduced information asymmetry and increased cooperation that result from the prevalence of employees with kin ties to founders (Honig, 1998; Powell & Eddleston, 2017) must be compared with the lack of diversity (Aldrich, 1999; Ruef, 2010) and nepotism concerns associated with founder–employee kin ties (Karra, Tracy, & Philips, 2006). founders with kin ties to their employees highlighted the following positive aspects: "*I*

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employed both family and nonfamily in the business that I ran. My best staff were the best because they were good employees, not because they were family members. However, the family members tended to stay longer, work a little bit harder on average, and, as we were seen as a family business, [they] fitted the image of the business better. The family members were more trustworthy. They did not want their reputation in the wider family to be damaged, and would never have stolen from me. My best employee was not, however, a family member, so I got together with her and made her one. We are still together to this day."

Although employees who are related to a founder may work harder than non-kin employees, non-kin employees may be concerned that kin are favored unfairly (Karra, Tracy, & Philips, 2006). One of the employees interviewed for this study made the following complaint: "*My last job was given to the daughter of the boss. She used all my work, claimed it was hers, and slandered my reputation. Her mother [presumably the founder] supported this. She was not interviewed [for] the post and it was not advertised. She did not have the relevant qualifications. She was given less work, more support, and more pay. This is why I don't trust companies made up of relations.*" Concerns about career progression were also raised by our interviewees: "*I do not trust the founding family member in...the firm to be as disciplined in regard to the expectations and demands of his/her familial employees. I have fact[s] to back up this evaluation. I have witnessed first hand what happens when employed by a company that [has a] familial structure…I worked twice as hard and got nowhere in terms of moving up in the company. The familial employee moved up twice and was terrible at his job.*"

Regarding the diversity of information, new firms in which vertical founder–employee kin ties are prevalent may be at a disadvantage due to network overlap, as compared with new firms in which kin ties between founders and employees are not prevalent (Aldrich, 1999; Ruef, 2010). With higher levels of vertical founder–employee kin

ties in new firms, cooperation is reduced, nepotism concerns increase, and diversity of information decreases, and these negative implications are not offset by a corresponding level of benefits. Therefore, we hypothesize as follows:

H1b: The prevalence of vertical founder-employee kin ties in new firms is associated with worse performance for these firms.

In our discussion in this section, we first explained why we had no prediction about how the extent of horizontal founder kin ties would influence the performance of new firms. Next, we proposed that the prevalence of horizontal employee kin ties is positively related to the performance of new firms (H1a) and that the prevalence of vertical founder–employee kin ties is negatively related to the performance of new firms (H1b). In the following set of predictions (Hypotheses 2a, 2b, and 2c), we develop corollaries for comparisons between firms on the basis of the prevalence of different types of structural kin ties. We do not introduce any new mechanisms in this discussion, but focus on the same four mechanisms previously identified as relevant to the effect of kin on new firm performance. The extrapolation, however, allows us to more clearly establish the performance implications of relative differences in the accumulation of the four mechanisms (information asymmetry, cooperation and conflict, diversity, and nepotism).

The extent of horizontal employee kin ties versus the other two types of kin ties: We start by comparing the influence of the extent of horizontal employee kin ties on new firm performance with the extent of (i) horizontal founder kin ties and (ii) vertical founder kin ties. First, with regard to reduced information asymmetry, as the extent of kin ties of a given type increases, all three types may benefit in terms of coordination and assigning roles (Aldrich, 1999; Ruef, 2010). Second, we expect the cooperation benefits to diverge as follows, due in part to the episodic conflicts between kin that may spill over into the new firm. We expect

kin pairs to augment cooperation for all three types, but predict that the potential negative spillover effect of conflict between kin will be smallest when horizontal employee kin ties (as compared with the other two types of kin ties) are prevalent, because employees are rarely responsible for critical decisions in either established or new firms (Alchian & Demsetz, 1972; Williamson, 1985). However, the prevalence of horizontal founder kin ties or vertical founder–employee kin ties may be detrimental for a new firm's progress in cases of conflict between kin, due to the involvement of the founder in this conflict (Ucbasaran et al., 2003). Therefore, on balance, we expect that similar levels of cooperation will arise from the prevalence of kin in new firms for all three structural types of ties, but that debilitating conflict will be less likely when horizontal employee kin ties (as compared with horizontal founder kin and vertical founder–employee kin ties) are prevalent.

Third, we compare the levels of access to novel information that the key decision-makers, i.e., founders, in new firms possess as a function of the extent of these types of kin ties. When horizontal employee kin ties are prevalent, founders have no kin ties with initial employees, so we expect founders to have access to more diverse information (Aldrich, 1999; Ruef, 2010) than in cases with a high level of horizontal founder kin ties or vertical founder–employee kin ties. In short, the key decision-makers, i.e., founders, in new firms are expected to have access to more diverse information when horizontal employee kin ties, rather than the other two types of ties, are prevalent.

Fourth, we note that nepotism concerns may arise among non-kin members in new firms with any type of structural kin ties, due to the concern that kin employees will form a sub-group and garner more than their fair share of resources and opportunities (Brewer, 1979; Karra, Tracy, & Philips, 2006). However, the effect of in-group favoritism (in our case, nepotism) on performance may vary with the structural position of kin ties. We suggest that the least powerful, and therefore the least disruptive to overall performance, of the three types

of structural kin ties is the horizontal employee kin ties. Employees are less powerful than founders, and the employees, in this case, do not have kin ties to the founders. Hence, horizontal employee kin ties in new firms are linked to lower levels of nepotism concerns than horizontal founder or vertical founder–employee kin ties.

Therefore, we expect new firms with prevalent horizontal employee kin ties to have advantages—in terms of the diversity of information, overall cooperation, and (lower) susceptibility to nepotism concerns—over new firms in which vertical founder–employee kin ties are prevalent (H2a below). Similarly, we expect the prevalence of horizontal employee kin ties in new firms to yield advantages over similar levels of horizontal founder kin ties in terms of information diversity and overall cooperation (H2b below). Accordingly, we hypothesize as follows:

> *H2a: The prevalence of horizontal employee kin ties in new firms is associated with better performance for these firms, when compared to the prevalence of vertical founder-employee kin ties in new firms.*

> *H2b: The prevalence of horizontal employee kin ties in new firms is associated with better performance for these firms, when compared to the prevalence of horizontal founder kin ties in new firms.*

Extent of horizontal founder kin ties versus Extent of vertical founder-employee kin ties: Our earlier discussion of the extent of horizontal founder kin ties did not enable us to predict the performance of new firms with such ties as compared to firms with no kin ties. We now compare the extent of horizontal founder kin ties with the extent of vertical founder–employee kin ties to assess whether the aggregation of mechanisms will lead to a prediction about new firm performance in this comparison. Although the benefit of reduced information

asymmetry (Baker & Aldrich, 1994) and the disadvantage of reduced information diversity (Ruef, 2010) may result from both kinds of tie, we expect nepotism concerns and their implications for overall cooperation to be different. When vertical kin ties between founders and employees are prevalent, non-kin employees may worry that kin employees will be favored. In contrast, as horizontal founder kin firms have no kin employees, such concerns about favoritism are unlikely to arise (Karra, Tracy, & Philips, 2006). For instance, one of our interviewees offered the following explanation: "*Having worked with companies in the past where I'm on even footing with someone who has a tie to the upper management, it makes my job incredibly difficult because of how things get delegated. If the relationship is between two people in upper management above me, there is less risk of nepotism affecting me as strongly.*" A respondent who had not worked at either type of firm also conjectured as follows: "*In [new firms with vertical founder–employee kin ties], as the other employee is directly related to the founder, should any problems arise between myself and the employee I feel that they would always be favoritised and given special treatment. In [new firms with horizontal founder kin ties] this is not the case. The other employee would be on the same playing field as me, as it would be only the two bosses that are related and would most likely treat both of us the same.*"

In addition, although conflict between kin may be more debilitating when it involves founders rather than employees, we suggest that conflict between founders may be muted by the presence of high-powered incentives, i.e., ownership in the new firm, for founders who make their rewards contingent on firm performance (Hellmann & Wasserman, 2016). Such high-powered incentives to preempt or resolve conflict are much less likely to be operative when vertical founder–employee kin ties are prevalent, because employees—even kin employees—typically have a smaller share of the ownership of the new firm than founders do. More generally, inequity has been reported to lead to lower utility regardless of whether it

is advantageous (an individual receives more than peers) or disadvantageous (an individual receives less than peers) (Fehr & Schmidt, 1999). Therefore, even those kin employees who are favored (advantageous inequity) may not necessarily be comfortable being favored over peer employees, with implications for the overall functioning of the firm. Another interviewee commented as follows: "*I have worked for a company where two of the directors were related. I have also worked for a company [with vertical founder–employee kin ties]. In my experience, the [horizontal founder kin ties] company works better as the 'family' are on the same level, meaning they work together. However, at the [vertical founder–employee kin ties] company I worked for, staff often felt that the employee who was related was treated better than they were. On the flip side, the related employee may feel that other staff are constantly suspicious of them reporting back to management.*" In new firms with prevalent vertical founder–employee kin ties, compared with horizontal founder kin ties, the negative effect of nepotism is expected to be larger, in turn reducing overall cooperation. Therefore, we posit that:

> *H2c: The prevalence of horizontal founder kin ties in new firms is associated with better performance for these firms, when compared to the prevalence of vertical founder-employee kin ties in new firms.*

DATA AND METHODS

To test our predictions, we need systematic data on the kin ties of all initial members (founders and employees) of new firms, and data on the performance of these new firms. Below we provide an overview of our data and sources.

Registry data. Registry databases in Scandinavian countries allow researchers to access comprehensive data on individuals and firms after a thorough ethics approval process. These databases play an important role in studies testing sociological and management

theories of entrepreneurship and new firm performance (a few examples are Sørensen, 2007; Nanda & Sørensen, 2010; Folta, Delmar, & Wennberg, 2010; Dahl & Sorenson, 2012). The availability of systematic data on new firms, the absence of survival bias, and the high degree of reliability—which are difficult to secure in alternative data-collection designs—make these databases a very useful tool for studying the performance of new firms.

Data

We use data provided by Statistics Sweden, a Swedish government agency. The data cover new organizations founded between 1998 and 2003 in the greater Stockholm metropolitan area. There are 4,967 firms in the sample with data for the variables analyzed. We begin with all firms founded in the greater Stockholm area that have at least one employee, and for which the required information for our analysis is available. We then exclude firms with no employees or more than 50 employees and firms that generated more than the equivalent of US$50 million in sales in their first year. The excluded firms with no employees may be shell companies registered for tax planning or dormant firms, and the firms excluded for having more than 50 employees or making than US$50 million in sales in the first year are likely to be cases of corporate diversification. These cases could distort our inferences if left in the sample. We obtain detailed demographic and employment data on all of the founders and salaried employees of these organizations, totaling more than 50,000 individuals. Our data on the founders and employees extend back to 1990, which enable us to consider their relevant attributes over a sufficiently long period. We also have information on the kin ties of all individuals who have resided in this area for the same period, which means that we have information on the kin ties of the founders and initial employees of these organizations. The detailed information, including data on income, on all actual and potential founders and employees in this area (approximately 2 million individuals between 1990 and

2003), also allows us to distinguish between exits that are due to "cashing out" (successful exits) and those that are due to "flaming out" (exits due to failure).

In terms of the comparability of Swedish data and data from other developed countries, Gonzalez (2017) compares 14 developed countries, including Sweden and the U.S., and reports that the 5-year survival rate of new firms in Sweden is nearly 13% higher than the average of 47%.

Dependent Variables

Survival is the most commonly used dependent variable in studies assessing the performance of new firms (Carnahan et al., 2012), because most new firms generally fail in the first five years of their operations (Geroski et al., 2010; Gonzalez, 2017). In survival analysis, survival time is measured as the age of the firm at failure or at the end of the sample (or observation) window (where right censoring is accounted for by the survival analysis estimation strategy). In our sample, the survival age is 2.72. (This is subject to right censoring, as some of these firms continue to exist beyond our observation window; we report the figure here for illustration and note that our survival estimation accounts for such censoring.)

Issues with survival as a measure of performance. A potential problem with survival analysis is that a simple categorization of exits can include, and therefore treat as the same, not only failures but also successful exits, i.e., the sale of the firm. The use of registry data with additional information on founders' income and wealth provides one way to address the potential confounding of successes and failure under the same category. To address this vexing problem, we use data on the individual income and wealth (capital income) of all of the founders for the entire period of the study to identify founders who had substantial income and wealth gain in the three-year window after the closure—or "exit"—of their firms compared with the last year of the firm's existence. We identify 27 cases in which the firms

had ceased to exist but their founders subsequently experienced an increase in their total income and wealth of more than one standard deviation above the mean. Specifically, we take the average change in the total income and wealth of all founders in the three years after their firms ceased to exist, and then use a cut-off equal to one standard deviation above this average as an indication that the exit was successful, rather than due to failure. Therefore, we reclassify these 27 firms that had ceased to exist as successful exits rather than failures. As we note in our estimation strategy description below, our use of competing-hazard models accounts for the differences between exits due to "flaming out" (failures) and "cashing out" (successful exits) (Arora & Nandkumar, 2011).

Sales as an additional dependent variable. Dencker and Gruber (2015) use a sales variable collected from entrepreneurs' reports of the total sales generated by their new firms in each year over the three-year period for which they have data (2001-2003). We assume that to calculate the total revenue of new firms that failed before the end of the three years, the authors assign a value of zero sales for the year(s) in which the firms no longer exist. We follow Dencker and Gruber (2015) in using total sales generated in the observation window as an additional dependent variable to test our predictions. As surviving firms presumably have some positive net sales in the year(s) that follow (unobserved), estimating sales without considering survival can be subject to right censoring bias in a way that survival analysis is not. However, as studies also use sales to assess performance, we also test all of our hypotheses using sales as an additional dependent variable.

Independent Variables

Initial members. Before measuring kin ties among initial members of new firms, we clarify what we mean by "initial members." The initial members of a new firm comprise founders and initial employees. More specifically, *Founders* denotes the board members of a firm in its first year of operations, who may also draw a salary from the firm. We do not

include in this set board members who may not be actively involved in the running of the firm. Therefore, we exclude substitute directors, accountants, and other quasi-legal professional service providers from the list of a firm's board members, before categorizing the remaining board members as founders. Although we could further remove from our list of founders directors of the focal firm who also draw a salary from somewhere else during the same period, Folta, Delmar, and Wennberg (2010) find that founders need not be employees of the new business. Therefore, we settle on including as founders all board members who are not consultants or other types of advisors, as we note above. *Initial employees* denotes salaried employees of the firm during its first year of operation. *Initial members*, then, refers to these two groups combined.

We construct the independent variables used to test our hypotheses by classifying firms by the location of kin ties among initial members: between founders, between employees, or between founders and employees. To provide a very general sense of the data, we create an indicator variable, *Kin*, that takes the value of 1 if any of the initial members in the new firm share a kin tie in the (first) year of its founding,[3] and otherwise 0. In our sample, 96 percent of the kin ties are ties between spouses, siblings, or parents and children. Of the 4,967 firms in our sample, 1,377 had one or more kin ties among their members in the first year of operation (27.7 percent), and 3,590 did not have any kin ties in this year. In the 1,377 firms with kin ties, the average number of such ties per firm is 4.

Firm structures. Firms differ by the location of ties, based on whether they connect employees to employees, founders to founders, or founders to employees. There are seven possible types of firm produced by these combinations of kin ties. In our sample, 281 firms have horizontal employee kin ties only, 132 have horizontal founder kin ties only, and 232

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[3] The kin ties we consider are those between a focal individual and his or her grandparents, parents, parents' siblings, children, siblings, spouse, spouse's parents, spouse's siblings, spouse's grandparents, and spouse's parents' siblings.

firms have vertical founder–employee kin ties only. Of the new firms with any two of the aforementioned three types, 5 have horizontal employee and horizontal founder kin ties only, 391 have horizontal employee and vertical founder–employee kin ties only, and 215 have horizontal founder and vertical founder–employee kin ties only. Finally, there are 121 firms that have all three types of kin ties (see Figure 2).

Insert Figure 2 here

Continuous measures of kin. The indicators of kin ties mentioned above may underestimate or, more generally, noisily measure the effects of the extent of kin ties on performance, as they do not capture the potential variation in the extent or prevalence (as opposed to the presence or absence only) of kin ties. Therefore, in our estimations, we instead use a continuous measure of kin ties, which is the ratio of kin to the relevant set or subset of initial members of the new firm. Accordingly, *Vertical founder-employee kin* is the ratio of the number of such kin to the number of all initial members (founders and employees) of the new firm, *Horizontal employee kin* is the ratio of the number of such kin to the number of employees, and *Vertical founder kin* is the ratio of the number of such kin to the number of founders.

Operationalization of hypotheses. Hypotheses H1a and H1b concern the performance of new firms as a function of the prevalence of horizontal employee and vertical founder–employee kin ties. Hypotheses H2a and H2b compare the performance of new firms based on the prevalence of horizontal employee kin ties and the prevalence of vertical founder–employee kin ties and horizontal founder kin ties, respectively. Finally, Hypothesis H2c compares the performance of new firms according to the prevalence of horizontal founder kin ties and vertical founder–employee kin ties. We use the corresponding continuous measures of kin, as described above, to test these hypotheses.

Control Variables

Founder size is the number of founders of the new firm. *Number of employees* is the number of initial employees in the new firm. We measure the *Opportunity cost* of members (calculated separately, as the *Opportunity cost of founders* and the *Opportunity cost of employees*) using the average of the corresponding members' past three years of income. The opportunity cost of members is an important consideration in analyses of new firm creation based on economic theory and organizational theory. Economists use opportunity cost as a threshold for switching from employment to entrepreneurship and thus estimate the long-term returns of switching to entrepreneurship (Hamilton, 2000; Parker, 2004). Organizational theorists use past wages to measure the constraints faced by founders and the quality of inputs entering a firm (Bidwell et al., 2013). For the new firms in our sample, the average opportunity cost of founders is 366,049 Swedish Kronor per annum and that of initial employees is 245,721 Swedish Kronor per annum.

In addition to opportunity costs, we control for founders' human capital characteristics that may influence the performance of a new firm (Shane & Venkatraman, 2001). *Founder prior occupation* is the proportion of founders who worked previously in the same industry as that of the focal new firm. This variable enables us to control for specific human capital that is relevant to the new firm. Founders with specific human capital may be more likely to understand the requirements of the new business and mobilize resources from their pre-existing networks to avoid failure (Davidsson & Honig, 2003). *Founders prior new firm experience* is the proportion of founders with experience of starting new firms before the current new firm (which we can observe for 1990 onward, but not before, due to the limited time span of our data). Founders with prior new firm founding experience have a more realistic understanding of the uncertainties involved in the creation and running of a new business, and hence may be less likely to make errors of overconfidence (Cassar, 2014).

Founder parent new firm experience is the proportion of founders whose parents started new firms prior to the founding of the current new firm. Individuals socialized into new business creation and management by observing their parents are more likely to enter into entrepreneurship themselves (Kim et al., 2006). To the extent that such preparation helps entrepreneurs, we expect new businesses created by entrepreneurs whose parents were also entrepreneurs to be more likely to survive. *Founder spouse new firm experience* measures the proportion of founders whose spouses started new firms before the creation of the current new firm. The founding experience of their spouses may also inform the entrepreneurs and hence influence the survival of the new firms (Manolova, Carter, Manev, & Gyoshev, 2007). We also control for the age and education of the founders. *Founder age* is the average age of the founders in the year of the founding of the new firm. *Founder education* is the average education level of the founders on a 7-point scale ranging from pre-school to graduate education. In addition, we control for gender and immigration status. *Employee gender female* and *Founder gender female* are the proportions of female employees and female founders, respectively. *Employee immigrants* and *Founder immigrants* are the proportions of employees and founders, respectively, who are immigrants (non-Swedish citizens), as previous studies find that gender (Carter, Williams, & Reynolds, 1997) and immigrant entrepreneurship (Evans, 1989) may induce differences. Given the emphasis placed on gender and immigration status in research on new firms, we also control for the percentage of initial employees who are female and who are immigrants. As a last control variable, *Minimum two founders and two employees* is an indicator variable capturing whether the new firm has at least two founders and two employees. Although we also use separate measures of founder size (number) and employee size (number), this indicator allows us to account for discrete differences between new firms that have at least two founders and two employees

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(and therefore can accommodate multiple types of kin ties across all levels) and new firms that do not.

We construct an additional variable to be used as an instrument for the prevalence of kin ties in a firm. *Count of founders' and spouses' siblings* denotes the average number of siblings of the founders and the founders' spouses. We describe this variable further below in the estimation strategy section.

We present the summary statistics and correlations of our variables in Table 2. We note that the minimum threshold of income reported to tax authorities may be negative.

Insert Table 2 here

Estimation Strategy for Survival of New Firms

One of our dependent variables (whether a firm survives to the end of the observation window) is susceptible to right censoring bias. Survival analysis, which is frequently used to study the survival of new firms, accounts for this bias (Allison, 2010). We use Cox regression to conduct our survival analysis.

An obstacle to making valid inferences about survival with respect to our hypotheses is that the extent (or prevalence) of kin in new firms may be related to the constraints faced by founders, which may be greater when kin ties in the new firm are prevalent, as founders lack alternative means to attract non-kin members. These constraints may also influence the survival of the new firm. Hence, the apparent "treatment effects" of kin on the survival of the new firm could be driven partially by the potential endogenous dynamics summarized above. Below we detail how we acknowledge and account for this possibility.

Accounting for Endogeneity

We implement an estimation strategy (Terza, Basu, & Rathouz, 2008) with first stage endogeneity correction for our survival analysis. This approach, known as two-stage residual

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inclusion (2SRI) estimation, was initially developed for epidemiological studies and is now used in a range of disciplines, such as economics (e.g., Bradford, Zoller, & Silvestri, 2010) and finance (e.g., Chen, Hong, Jiang, & Kubik, 2013). The estimation strategy works as follows. In the first stage, together with the usual set of control variables, an instrumental variable is used to calculate the residuals in predicting the potentially endogenous variable. In the second stage, the residuals from the first stage are included as an additional control variable to account for possible self-selection.

Motivation for using the instrument. The variable *Count of founders' or their spouses' siblings* is a proxy for founders who have a larger pool of kin to draw on. It measures the possibility that some founders rely more than others on kin ties, even at similar levels of wealth, income, age, and education (given that we control for these variables).

Empirical tests of the instrument. This variable satisfies the empirical criteria for being classified as an instrumental variable, i.e., related to the prevalence of kin ties in a firm (the first-stage estimation) but not directly related to the performance of the firm (the second-stage estimation). In the first-stage estimation, when used to predict the ratio of kin ties, *Count of founders' or their spouses' siblings* is related to the prevalence of kin ties (see Table 3a, Model 1). However, as is desirable for an instrumental variable, in the analysis that predicts performance (not reported here), we find that this variable is not a significant predictor of either the survival ($b = 0.98; p > .16$) or sales ($b = -0.006; p > .83$) of new firms.

RESULTS

Endogeneity correction. Before we test our hypotheses, we present the results of the first stage of the 2SRI estimation, conducted to account for potential endogeneity related to the prevalence of kin ties. We predict our continuous measure of the extent of kin ties in a new firm in the first stage using all of the variables in the second stage and *Count of founders' and their spouses' siblings* as the instrumental variable. As anticipated, *Count of*

founders' and their spouses' siblings (Table 3a, Model 1, $b = 0.02$; $p < .001$) is a positive predictor of the prevalence of kin ties.

Hypotheses testing. In Table 3a, we present the results of our tests of Hypotheses 1a and 1b. In Model 3, we conduct a survival analysis that accounts for successful exits, and in Model 5 we use sales as the dependent variable. Models 2 and 4 are the baseline models for survival and sales estimations, respectively. All of the models include the overall ratio of all kin ties in the new firm and the second-stage residual correction variable to account for endogeneity.

We first examine the results for H1a and H1b. These hypotheses predict the performance effects of the extent of horizontal employee kin ties and vertical founder–employee kin ties in new firms, respectively. Next, in Table 3b, we present the formal tests of our predictions regarding the differences between the three structures, i.e., H2a, H2b, and H2c. To conduct these tests, we examine whether the coefficient of horizontal employee kin ties, as compared with vertical founder–employee kin ties (for H2a), and the coefficient of horizontal employee kin ties, as compared with horizontal founder kin ties (for H2b), are different from each other. For H2c, we examine whether the coefficient of vertical founder–employee kin ties and that of horizontal founder kin ties are different from each other. For all of these comparisons, we conduct the tests using a one standard deviation change in the relevant coefficients.

Although we did not formulate a prediction about the performance impact of the extent of horizontal founder kin ties, we nevertheless review the findings that speak to this relationship before considering the results that relate to Hypotheses H1a and H1b. The extent of horizontal founder kin ties in new firms is not significantly related to sales (Table 3a, Model 5: $b = 0.06$, $p > 0.71$), and is not within conventional levels of significance in the survival estimation (Table 3a, Model 3, $b = 0.71$, $p > 0.05$). These results suggest that the

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extent of horizontal founder kin ties in new firms is not related to the sales or survival of new firms (at the conventional statistical test level of $p < 0.05$; we note, however, that $p = 0.07$ for survival and so the case is not as clear as the $p > 0.71$ for sales).

H1a suggests that the extent of horizontal employee kin ties will positively influence the performance of new firms. This hypothesis is supported for the estimations of both sales (Table 3a, Model 5: $b = 0.51$, $p < 0.05$) and survival (Model 3: $b = 0.53$, $p < 0.01$). Thus, the results suggest that the extent of horizontal employee kin is positively related to firm performance, supporting H1a. We also illustrate the effect sizes in our estimations, which can be calculated similarly for the results of H1b. For survival models, the effect size of a one standard deviation increase in the ratio (prevalence) of horizontal employee kin ties, with some conventional assumptions, is associated with a 7 percent reduction in the risk (or rate) of failure ($1 - 0.53$ [the coefficient] $= 0.47$. Then, $0.47 * 0.15$ [the std. dev.] $= 0.0705$.) For the sales models, a one standard deviation increase in the ratio (prevalence) of horizontal employee kin ties is associated with a 10 percent increase in sales (with the log-transformed dependent variable, we exponentiate the coefficient ($\exp(0.51) = 1.66$), then (($1.67 - 1$) * 100) * 0.15 [the std. dev.] $= 10.05$.)

H1b suggests that the extent of vertical founder–employee kin ties in new firms is negatively related to the performance of these new firms. This hypothesis is supported for sales estimations (Table 3a, Model 5: $b = -1.17$, $p < 0.01$). However, this hypothesis does not receive support in survival estimations (Table 3a, Model 3: $b = 1.21$, $p < 0.47$). Thus, these results only partially support the prediction that the extent of vertical founder–employee kin ties hurt the performance of new firms. The extent of vertical founder–employee kin ties is related to lower sales, but does not reduce the likelihood of survival of new firms.

Having examined the main effects of the two structural hypotheses, we turn to predictions that compare the extent of different types of kin-related structures, as set out in

H2a, H2b, and H2c. We report the test statistics that correspond to a formal statistical investigation of these relationships in Table 2b.

H2a suggests that the performance of new firms, as based on the extent of horizontal employee kin ties, is better than that of new firms on the basis of the extent of vertical founder–employee kin ties. We test this hypothesis by examining whether the coefficients for the extent of horizontal employee kin ties (which is smaller than 1 in the survival analysis, and therefore linked to higher survival, and positive in predicting sales) and that of vertical founder–employee kin ties (which is greater than 1 in the survival analysis, and hence hastens exits and is negative in predicting sales) are significantly different from each other, which we find by comparing changes obtained from a one standard deviation change in both. Across both the survival and the sales estimations, we find support for H2a (Table 3b, Model 1, survival, chi-square = 10.25, $p < 0.01$; Model 2 sales, F-statistic = 14.57, $p < 0.001$).

H2b suggests that the performance of new firms with a prevalence of horizontal employee kin ties is better than that of new firms with a prevalence of horizontal founder kin ties. We test this hypothesis by examining whether the coefficient for the extent of horizontal employee kin ties (which is smaller than 1 in the survival analysis, and therefore linked to higher survival, and positive in predicting sales) and that of horizontal founder kin ties (which is smaller than 1 in the survival analysis, thereby linked to higher survival, and positive in predicting sales) are significantly different from each other, by comparing changes obtained from a one standard deviation change in both. For survival as a dependent variable, we find marginal support for this hypothesis, and with sales as a dependent variable it is supported (Table 3b, Model 1, survival, chi-square = 3.41, $p = 0.07$; Table 3b, Model 2 sales, F-statistic = 5.92, $p < 0.05$).

H2c suggests that the performance of new firms with a prevalence of horizontal founder kin ties increases is better than that of new firms with a prevalence of vertical

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founder–employee kin ties. We test this hypothesis by examining whether the coefficients for the extent of horizontal founder kin ties (smaller than 1 in the survival analysis, and thereby linked to higher survival, and positive in predicting sales) and vertical founder–employee kin ties (greater than 1 in the survival analysis, thereby associated with lower survival [hastening exit], and negative in predicting sales) are significantly different from each other. We do this by comparing the changes obtained from a one standard deviation change in both. Across both the survival and sales estimations, we find support for H2c (Table 3b, Model 1, survival, chi-square = 4.56, $p < 0.05$; Table 3b, Model 2 sales, F-statistic = 11.83, $p < 0.01$).

In summary, when considering sales as a dependent variable, all five of our hypotheses are supported. When using survival as a dependent variable, three of the five hypotheses are supported at the 95 percent confidence level, one hypothesis (H2b) is supported at the weaker 90 percent confidence level, and one hypothesis (H1b) is not supported. It is worth noting that because survival is an extreme outcome (and also discontinuous), when compared with sales (Gimeno et al., 1997), the results for survival may be observed only after a decision to close the new firm has been reached. The effect of the prevalence of different types of kin, as with other factors more generally, on such a comparatively extreme outcome might be less likely to be observed. The results with respect to sales, on the other hand, may be inferred from an outcome that is more granular, which may explain why our results are, on the margin, more supportive of the predictions in the case of sales as the performance metric. Finally, there may be a persistence of sub-optimal outcomes that are picked up in the survival analysis, especially when kin are present, possibly adding more noise to our measurement, whereas sales as a dependent variable is not subject to this concern.

Insert Tables 3A, 3B, 4, and 5 here

ADDITIONAL ANALYSIS

All seven structural categories disaggregated. In Table 4, we report the results for models in which all seven possible structural categories are captured by corresponding indicator variables (as opposed to the continuous ratio variables we use in our main results and in the main tests of our hypotheses), for ease of interpretation of the results and because some of these categories have very few observations (new firms) corresponding to them. In Model 1, we predict survival, and in Model 2, we predict sales. The seven structural categories (in which each category will have the specified type(s) of kin only and no other types) are horizontal employee kin, horizontal founder kin, vertical founder–employee kin, both horizontal founder and horizontal employee kin, both horizontal founder and vertical founder–employee kin, both horizontal employee and vertical founder–employee kin, and all three types of structural kin ties. These categories, mutually exclusively and collectively, are an exhaustive configuration of the structural types of kin ties we consider in our framework.

Using this specification, similar to prior results, we see that horizontal founder kin ties have no influence on the performance of new firms (Model 1, haz. rate. = 0.83, $p > 0.25$; Model 2, sales, b = 0.19, $p > 0.22$). We also find support for the hypothesis that horizontal employee kin ties (H1a) are positively related to new firm performance (Model 1, haz. rate. = 0.62, $p < 0.01$; Model 2, sales, b = 0.36, $p < 0.001$). We do not find support for the negative relationship between vertical founder–employee kin ties (H1b) and performance. The prediction of H2a, that new firms with horizontal employee kin ties perform better than new firms with vertical founder–employee kin ties, is supported (chi-square of differences in the coefficients in the survival models = 10.42, $p < 0.01$; F-statistic of differences in coefficients in predicting sales = 7.11, $p < 0.05$). The prediction of H2b, that new firms with horizontal employee kin ties perform better than new firms with horizontal founder kin ties, receives marginal support in the survival estimations (chi-square of survival hazard differences = 2.98,

p < 0.10) but no support in predicting sales (*F*-statistic of differences in coefficients = 1.11, *p* = 0.30). Finally, the prediction of H2c, that new firms with horizontal founder kin ties perform better than new firms with vertical founder–employee kin, is not supported (chi-square of the survival hazard differences is 0.46, *p* = 0.50; *F*-statistic of differences in coefficients in predicting sales is 1.99, *p* = 0.17). As noted earlier, our continuous measures probably capture relevant variation in the extent of different kinds of kin ties, which end up yielding stronger support for the predictions than the indicator measures used in this additional exploratory analysis (we chose the indicators here because, as can be seen in Figure 2, for some intersection configurations there are very few new firms in our sample in the first place).

Horizontal employee kin firms versus joint structural categories. Given the evidence of the higher performance of new firms with horizontal employee kin ties, we next compare these firms (using the results in Table 3 with all of the seven structural kin types) with new firms that have two or more of the kin types. New firms with horizontal employee kin ties (this indicator captures new firms with this type of kin ties only and no other types) perform similarly to or better than new firms with both horizontal founder and horizontal employee kin ties, new firms with both horizontal founder and vertical founder–employee kin ties, and new firms with both horizontal employee and vertical founder–employee kin ties. New firms with horizontal employee kin ties perform similarly to new firms with all three types of kin ties. The hazard ratios of survival are similar (chi-square of the differences of the hazard rates = 0.19, *p* = 0.66), as are the results in terms of sales (*F*-statistic of the differences = 0.20, *p* = 0.66). In sum, new firms with horizontal kin ties perform just as well as, and in most cases better than, new firms with any other of the seven possible structural kin tie types.

Boundary conditions: We expect the positive effect of horizontal employee kin ties and the negative effect of vertical founder–employee kin ties to be dampened in larger new

firms. Compared with their smaller counterparts, large firms are more likely to develop and are in greater need of formal policies and practices, which may mitigate the influence of informal structures. Regarding horizontal founder kin ties, we expect the lack of any predicted effect to be unchanged for large firms. We present our results in Table 5. In Model 1, as expected, the moderation effect of the number of employees on horizontal founder kin ties is not significant (haz. rat. = 0.93, $p > 0.15$). In Model 2, we find the same results for sales ($b = 0.06$, $p = 0.12$). Similarly, we see no moderation effect of the number of employees on the influence of horizontal employee kin ties on either survival or sales (Model 3: haz. rat. = 0.96, $p > 0.45$; Model 4: sales $b = 0.0004$, $p = 0.99$). In line with these results, we also find no evidence for the moderating effect of the number of employees on the negative effect of vertical founder–employee kin ties on sales (Model 6 $b = 0.14$, $p = 0.30$), but we do observe a moderation effect for survival (Model 5 haz. rat. = 0.77 $p < 0.05$), whereby the negative effect of the prevalence of vertical founder–employee kin ties is weaker in larger new firms.

We also conduct an additional analysis (not reported here) to examine whether the different types of variables regarding the extent of kin have non-linear effects on performance. In models that replicate Models 3 and 5 in Table 3a and add the second-order (quadratic) terms of the kin structural variables, none of these quadratic variables have a significant coefficient, suggesting that in our sample the linear specification appears to appropriately capture the relationships about which we hypothesize. In addition, we conduct a check by restricting our sample to new firms that have, alternatively, (i) a maximum of five founders or (ii) fewer than 10 founders, based on the possibility that in cases where there are many founders, some of the founders might be inactive or not meaningfully involved in the running of the new firm. Imposing these conditions reduces our sample by 9.5 percent and 1 percent, respectively. The pattern and significance of support for our hypothesized effects are very similar to those reported in the main results.

DISCUSSION

Our main contribution is to the literature on entrepreneurship. We develop a contingency approach to explain the heterogeneous effects of kin on the performance of new firms. Our approach makes a conceptual advancement by distinguishing between different structures of kin ties, based on whether they are between founders, between founders and employees, or between employees. In addition, we add to the more general stream of studies that use a contingency or comparative approach to investigate performance (or similar outcomes) when there are multiple concurrent mechanisms in operation.

Contribution to the literature on entrepreneurship. Our thesis is that the influence of kin ties on the performance of new firms depends on how these ties connect members within or across levels of the hierarchy. The effect of such ties may vary, because, depending on the hierarchical positions of the two individuals that the kin tie spans, the performance implications of some mechanisms may be amplified while others are dampened. Our review of the literature suggests that the effect of kin ties on the performance of new firms occurs primarily through four broad types of mechanisms, as follows: kin ties provide benefits by easing coordination, improving cooperation, and reducing information asymmetry, but they may also bring about nepotism concerns and reduce the diversity of information. Our structural approach provides a theoretical contingency framework that predicts when kin ties across or within hierarchical levels of a new firm may have a positive, negative, or no overall influence on the performance of the firm. The structural contingency approach allows us to derive predictions as to how the extent of kin ties in new firms is sometimes beneficial, sometimes detrimental, and sometimes not related to performance. A theory explaining the heterogeneity in the extent of kin ties in a new firm and their influence on performance, is important for the following two main reasons. (1) The results of the handful of studies that investigate the effect of kin ties on the performance of new firms are mixed (Bruderl &

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Preisendorfer, 1998; Bates, 1994; Santarelli & Tran, 2013; Arregle et al., 2015). (2) VC investors, as well as other experts in the field of entrepreneurship, often caution new firms against engaging kin (see Wasserman, 2012).

Our structural contingency model is tractable and generative. It is tractable in that it allows us to consider the joint effect of mechanisms that individually might yield a positive, negative, or null effect. It is generative in the sense that in other settings in which the emphasis on a given mechanism is stronger or weaker (or when new mechanisms are found to be relevant), the model will allow researchers to develop a different set of assumptions and generate predictions that, accordingly, might be different from the ones we developed here. As a result, the structural contingency model will allow for more coherent and systematic accumulation of future findings.

Our structural theory also adds granularity to the foundational theoretical perspective that views entrepreneurship as a family-embedded phenomenon (Aldrich & Cliff, 2003; Yang & Aldrich, 2014). The family-embedded perspective builds on the concept of embeddedness proposed by Granovetter (1985), according to which social agents are embedded in a web of social relations that may aid or constrain their economic actions. In this tradition, Aldrich and Cliff (2003) advance theory of how family ties may influence entry into entrepreneurship (Kim et al., 2006), the mobilization of resources (Kotha & George, 2012), and performance. While the extent of kin ties is well documented (Ruef, 2010), the consequences of kin ties in new firms are less well understood. For example, the family is mostly conceptualized as having a monolithic, i.e., one type of, influence on new firms. This view is not surprising, given that these studies are among the first to examine family influences in new firms. We add nuance to the family-embedded perspective by showing that the family effect is contingent on the structural location of family members in the new organization. By developing a framework that allows for contingent predictions, our structural perspective

enables us to move beyond the mixed findings in the literature by accumulating more coherent evidence of how kin in a new firm is related to firm performance.

Contribution to the configuration contingency perspective. Our secondary contribution is to the stream of studies in different areas investigating the joint effects of multiple mechanisms. This kind of approach is prominent in investigations of the effects of group diversity on group level outcomes (e.g., van Knippenberg & Schippers, 2007; van Knippenberg & Mell, 2016) and the performance implications of social network structures (e.g., Burt, 1997; Gargiulo, Ertug, Galunic, 2009). A similar approach is also used in research on the implications of homophily for performance (Ertug, Gargiulo, Galunic, & Zou, 2018) and studies of entrepreneurship (Bird & Zellweger, 2018; Stam, Arzlanian, & Elfring, 2014).

All of these studies are concerned with multiple mechanisms and the configurations that may amplify or suppress their effects. Once these contingencies are understood, it becomes possible to derive predictions about the joint aggregate effects of the mechanisms. In other words, the advancement on offer is not to uncover new mechanisms or directly offer evidence for the isolation of these mechanisms. It is taken as given that the mechanisms are relevant; the aim is to identify conditions (that suppress some mechanisms and amplify others) under which the combined effect of these mechanisms is greater/smaller or positive/negative.

Contribution to Practice

As entrepreneurship is episodic (and therefore most entrepreneurs do not accumulate extensive experience themselves), entrepreneurs rely heavily on the advice of mentors and investors, who typically work with many entrepreneurs. The received wisdom among some of these mentors and advice-givers that kin ties in new firms are necessarily detrimental to performance needs to be revised. Our results suggest that kin ties between founders are not negatively related to the performance of new firms. However, kin ties between founders and

employees appear to be, as we also anticipated in our hypotheses, a source of concern, as they are negatively related to performance.

Importantly, the type of kin ties that has been mostly unexplored in the academic literature—kin ties between employees of a new firm—is positively related to the performance of new firms. These findings call for more nuanced recommendations from mentors and investors who advise the founders of new firms about their recruitment of initial members. Rather than advise founders against the use of kin anywhere in the firm, our results suggest that mentors and investors might consider recommending that entrepreneurs do look into hiring the kin of employees, while cautioning them about hiring the kin of founders as employees.

Limitations

The structural approach we adopt focuses on how the prevalence of different configurations of kin ties in new firms may influence firm performance. Our focus is not on specific mechanisms (as desirable and valuable as this is in research that aims to do so explicitly), because our goal is to advance a structural approach that allows for contingent predictions about when kin ties are likely to enhance and when they are likely to hurt performance. Nevertheless, our approach can be complemented and enhanced by delving deeper into the specificities of the various individual mechanisms at work.

Our focus is on the typical, or expected, effects of kin ties in new firms. Naturally, not all new firms will conform to the overall patterns we find and predict. Future research could both expand and refine our framework to accommodate other systematic tendencies that might not be accounted for in the current framework.

Our structural approach can also be complemented by exploring factors that may moderate the structural predictions we have developed. We have outlined the reasons for why the joint effect of a set of core mechanisms accumulates differently under different structural

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conditions. Future research can delve deeper into the conditions under which one type of structural tie, e.g., horizontal founder kin ties, may be more influential than other types of structural ties. Such a consideration of founders might also enable future work to bridge the findings of past studies, which overwhelmingly concentrate on founders in new firms, with the contingent perspective developed in this paper.

Ours is a single-country study. When we compare our sample with those of previous studies based on data from other regions, we find a reasonable level of correspondence between our sample and previous studies from the developed world, although in Sweden new firms survive for longer. Nevertheless, it would be useful to examine multiple geographical locations concurrently to extend the insights from our study and assess their generalizability.

Beyond the kin ties we consider, shared religious affiliations and other institutional or political affiliations may influence coordination and cooperation among members of new firms. Accordingly, future research could examine whether and under what circumstances kin and other such affiliations act as complements or substitutes with respect to their effects on the performance of new firms.

We do not investigate the dynamic process by which individual members join a new firm, such as how certain recruits can subsequently be instrumental in bringing their kin into the firm (whether in the first year of its operations, as in our case, or thereafter). Therefore, future research could model the implications of various types of kin ties for such dynamic processes of member recruitment and their consequences.

Finally, we use large-sample longitudinal data from government registers to test our hypotheses. Process studies, particularly those focusing on mechanisms that enable or constrain entrepreneurs in their recruitment of different types of kin (e.g., Karra, Tracy, & Philips, 2006), would likewise be a useful way to expand and complement our approach.

CONCLUSION

Nearly 28 percent of the newly founded firms in our study have kin ties among their initial members. While kin are a source of solace and non-pecuniary benefits for entrepreneurs, reliance on kin has been presumed to be detrimental to the performance of their businesses. Our results indicate that the extent of kin in new firms may in fact both enhance the sales and aid the survival of these firms. The performance-enhancing effects are observed most clearly for horizontal employee kin ties, and the effects appear to be detrimental only when vertical founder–employee kin ties are the sole, or predominant, type of kin ties in the firm.

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Figure 1: A Typology of the Kin Ties Considered in this Study
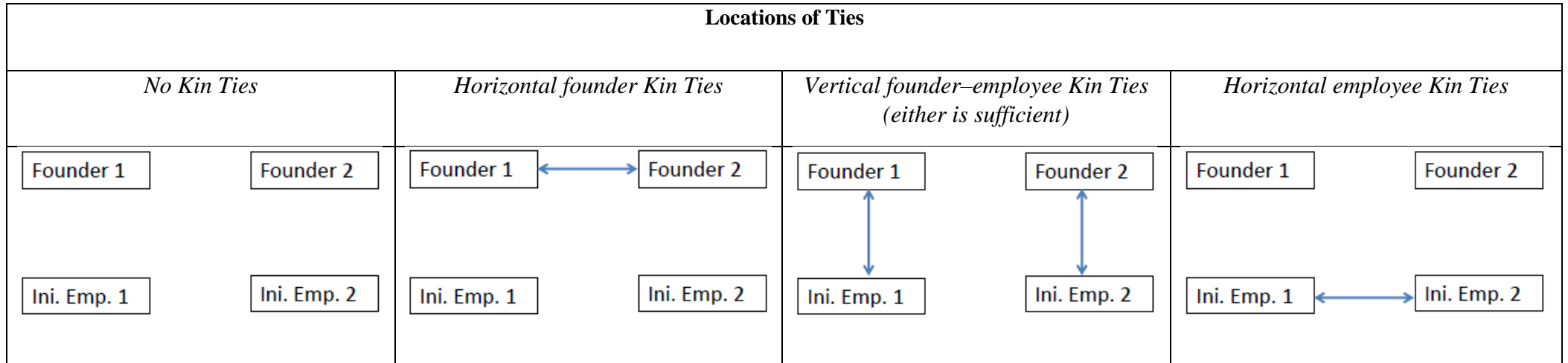
"Ini. Emp.," which stands for "initial employee," refers to an employee hired in the first year of a firm's operations.

Figure 2: Sample by Types of Kin Ties

Firms with no Kin Ties
(n= 3,590)

Horizontal Employee Kin Ties
(n= 281)

Horizontal Founder Kin Ties
(n=132)

Vertical Founder-Employee Kin Ties
(n=232)

Both Horizontal Employee & Horizontal Founder Kin Ties
(n= 5)

Both Vertical Founder-Employee & Horizontal Employee Kin Ties
(n= 391)

Both Vertical Founder-Employee & Horizontal Founder Kin Ties
(n= 215)

All three types of Kin Ties
(n= 121)
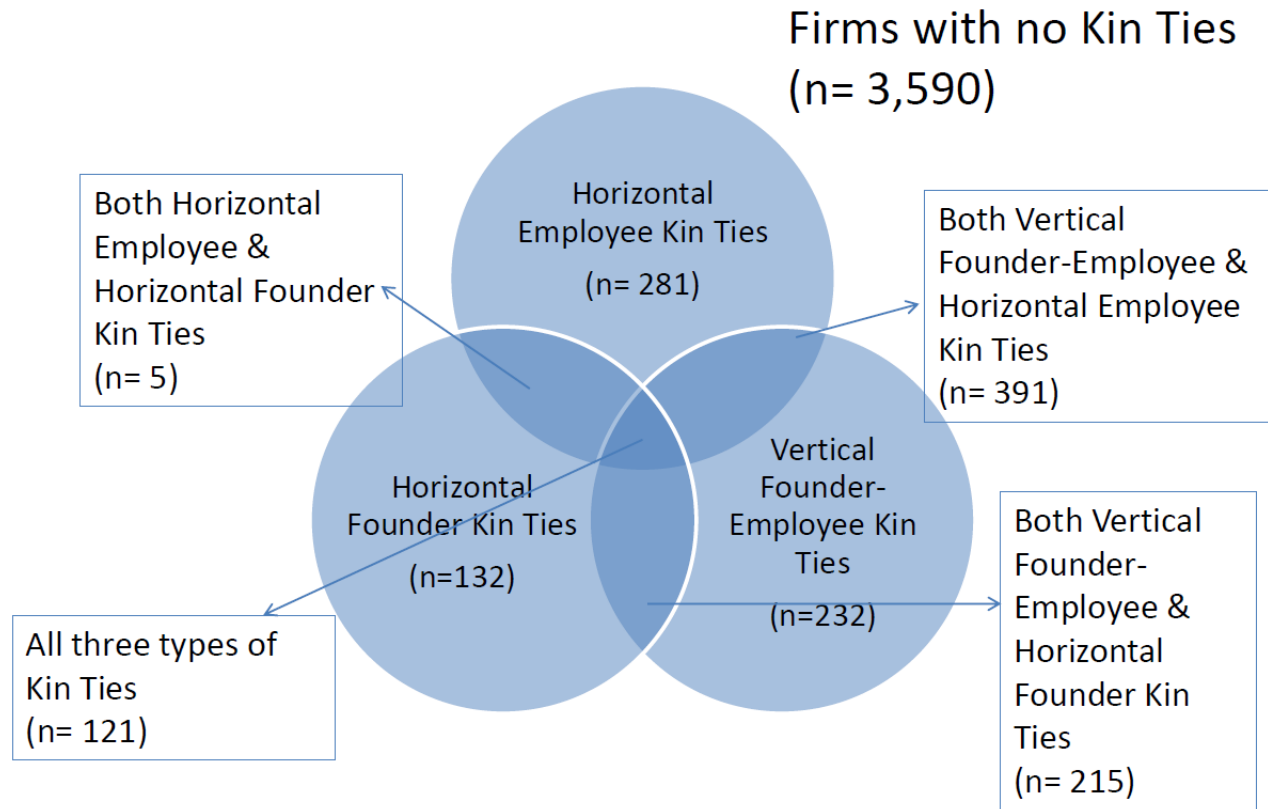
Table 1: Illustrative Studies on the Performance of New Firms with Kin Ties

Findings	Paper	Context	Performance Metric	Mechanism (explicit/implied)	Findings and Implications
Positive	Brüderl & Preisendörfer (1998)	New firms	Survival, employment, sales	Strong ties in networks are related to resource assembly	The findings are consistent with the prediction that strong ties (friends and family are included as a composite in this definition) in the network of the entrepreneur/founder lead to longer survival. The study suggests that kin ties in new firms may yield survival benefits and modest benefits on other performance dimensions as sales. The implication for our study is that the extent of family ties in new firms may be positively related to new firm performance.
	Cruz et al. (2012)	Micro-enterprises & SMEs	Sales	Family employment in micro and small enterprises enhances performance because of cooperation benefits and cost of labor	The results are consistent with the view that family employment in micro-enterprises and SMEs enhances performance. The implication for our study is that the extent of family ties in new firms may be positively related to the new firm's performance.
	Powell & Eddleston (2017)	SMEs	Performance	Social support from family is positively related to performance	The results are consistent with the view that family employment in SMEs enhances their performance. The implication for our study is that the extent of family ties in new firms may be positively related to new firm performance.
Negative	Mozumdar et al. (2019)	Entrepreneurs	Performance	Over-embedded dependence on family and friends is negatively related to performance	Over-embedded dependence, i.e., excessive reliance, on family and friends in a developing country like Bangladesh is detrimental to performance. The implication for our study is that the extent of family ties in new firms may be negatively related to new firm performance.
	Yu, Tao, Chen, Zhang, & Xu (2019)	Digital businesses	Performance	Family ties reduce the legitimacy of stores	In a sample of Chinese online stores, the presence of family is negatively related to performance in a market place. Reliance on kin in new firms may reduce the legitimacy of

				judgments about the new firm and lead to the withholding of resources by others, and consequently negatively influence the performance of new firms. The implication for our study is that the extent of family ties in new firms may be <u>negatively</u> related to new firm performance.
	Valdez (2008)	Entrepreneurs	Entry and performance	Social capital helps with entry but not with performance; human and 'market' capital help with performance post-entry	Reliance on social capital is detrimental to immigrant entrepreneurs' growth in the U.S. (post-entry human capital and access to resources are more important). The implication for our study is that the extent of family ties in new firms may be <u>negatively</u> related to new firm performance.
Unclear Findings / No Effect	Arregle et al., (2015)	New firms	Sales growth	Moderate reliance on family for advice, emotional support, and resources is best, but too little and too much reliance is sub-optimal	The prediction is that very little or very high family involvement in business resources (U-shaped) and the converse in emotional support (inverse U-shaped) are linked to sales growth. The <u>inconsistent pattern of results</u> suggests that focusing on the different types of resources may not be the most fruitful avenue.
	Santarelli & Tran, (2013)	New firms	Profitability	Strong ties (family & friends) leads to resource assembly and increased profits	The prediction is that relying on the family is beneficial for new firm performance. However, the results suggest that receiving support from family has <u>no effect</u> on the performance of new firms.
	Davidsson & Honig (2003)	New firms	Entry, sales, & profitability	Support from strong ties is important for entry and success	Social capital (measured as parents, friends, and neighbors in business in an individual's network) leads to entry; but not to profitability or sales conditional on entry. Membership in professional business networks is related to sales and profitability. The suggestion is that relying on professional networks in new firms may lead to better performance but reliance on social capital is not related to performance. The implication for our study is that the extent of family ties in new firms <u>may not be related to</u> the performance of the new firm.

Table 2: Descriptive Statistics and Correlations

No.	Variable	Mean	Std. Dev.	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Sales	8.31	2.32	.00	16.22																					
2	Kin (ratio)	.14	.27	.00	1.00	.02																				
3	Opportunity cost of founders	11.86	2.98	-2.30	15.26	.04	-.01																			
4	Opportunity cost of employees	11.81	2.06	-2.30	15.63	.06	-.02	.40																		
5	Year of firm founded	2000.24	1.57	1998	2003	-.21	-.02	-.03	.08																	
6	Number of employees	4.79	6.35	1.00	50.00	.30	-.02	.06	.06	.09																
7	Founder size	2.75	2.04	1.00	22.00	.09	-.06	.25	.16	-.03	.23															
8	Founder prior occupation	.29	.37	.00	1.00	.02	-.09	.02	.04	.05	.00	-.12														
9	Founder new firm experience	.39	.39	.00	1.00	-.01	-.08	.06	.06	.06	.01	-.10	.81													
10	Founder parent new firm experience	.04	.16	.00	1.00	-.01	.05	.01	-.03	-.05	-.01	-.02	.06	.09												
11	Founder spouse new firm experience	.04	.16	.00	1.00	-.01	.06	.01	.02	.03	.01	-.02	.01	.07	.05											
12	Founder age	43.56	9.59	18.00	73.00	-.01	.07	.09	.07	.06	.00	.03	.12	.14	-.19	.04										
13	Founder education	4.51	1.30	1.00	7.00	-.02	-.07	.21	.14	-.01	.05	.26	.01	.03	-.07	.00	.04									
14	Employee gender	.31	.36	.00	1.00	.00	.11	.01	-.03	.05	.11	.02	.00	-.01	.00	.10	.03	.09								
15	Employee immigrants	.07	.19	.00	1.00	-.02	-.03	-.07	-.06	.04	.04	-.05	-.01	-.01	-.02	-.01	-.02	-.08	.01							
16	Founder gender	.25	.26	.00	1.00	-.05	.12	-.08	-.06	.01	-.10	-.27	-.02	-.05	-.04	.15	.10	-.13	.26	.03						
17	Founder immigrants	.04	.13	.00	1.00	-.03	-.01	-.06	-.05	.00	-.01	-.02	-.08	-.09	-.01	.02	-.09	-.07	.01	.43	.03					
18	Residuals	.00	.26	-.56	1.00	.02	.96	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00				
19	Vertical founder–employee kin (ratio)	.04	.11	.00	.83	-.03	.81	-.01	-.03	-.02	-.08	-.10	-.12	-.11	.02	.05	.07	-.04	.11	-.03	.12	.00	.78			
20	Horizontal founder kin (ratio)	.04	.14	.00	1.00	.01	.59	.04	.00	-.03	-.04	.08	-.11	-.10	.07	.09	.04	-.03	.04	-.04	.09	-.01	.56	.41		
21	Horizontal employee kin (ratio)	.05	.15	.00	1.00	.06	.70	-.05	-.01	.00	.02	-.09	.01	.01	.01	.02	.05	-.08	.07	-.01	.06	-.01	.68	.51	.14	
22	Min. two founders and two employees	.48	.50	.00	1.00	.23	.00	.18	.14	.02	.36	.51	-.10	-.10	.00	-.02	-.09	.11	.06	.01	-.22	.02	.00	-.03	.07	.07

n = 4967. Correlations stronger than |.03| are significant at $p < .05$.

Table 3a: First-Stage Correction and Predictions of Performance as Survival and Sales (H1a and H1b) [a]

Variable	M1: Kin First Stage		SURVIVAL M2: Baseline		M3: Hypotheses Testing		SALES M4: Baseline		M5: Hypotheses Testing	
	Coeff.	s.e.	Haz.	s.e.	Haz.	s.e.	Coeff.	s.e.	Coeff.	s.e.
Theory variables										
Horizontal founder kin (no prediction)					.71	(.13)			.06	(.17)
Horizontal employee kin (H1a: positive)					**.53****	**(.11)**			**.51***	**(.24)**
Vertical founder–employee kin (H1b: negative)					1.21	(.31)			**-1.17****	**(.31)**
Control variables										
Opportunity cost founders	.00	(.00)	1.01	(.01)	1.00	(.01)	-.01*	(.00)	-.01	(.00)
Opportunity cost of employees	-.00	(.00)	.98	(.01)	.99	(.01)	.06***	(.01)	.06***	(.01)
Number of employees	-.00*	(.00)	.96***	(.01)	.96***	(.01)	.10***	(.01)	.10***	(.01)
Founder size	-.01***	(.00)	1.00	(.01)	1.00	(.01)	-.05	(.03)	-.05	(.03)
Founder prior occupation	-.05**	(.02)	.73**	(.08)	.74**	(.08)	.47**	(.14)	.44**	(.14)
Founder new firm experience	-.03	(.02)	1.15	(.09)	1.15	(.09)	-.20	(.14)	-.20	(.14)
Founder parent new firm experience	.11***	(.03)	1.3	(.19)	1.32	(.20)	-.36	(.24)	-.37	(.23)
Founder spouse new firm experience	.06*	(.03)	1.25*	(.11)	1.26*	(.12)	.01	(.15)	.01	(.15)
Founder age	.00***	(.00)	1.00	(.003)	1.00	(.00)	.00	(.00)	.00	(.00)
Founder education	-.01**	(.00)	1.01	(.02)	1.00	(.02)	-.03	(.04)	-.03	(.04)
Employee gender	.07***	(.01)	1.07	(.10)	1.06	(.10)	-.07	(.18)	-.07	(.18)
Employee immigrants	-.04*	(.02)	.87	(.14)	.87	(.13)	-.27	(.16)	-.27	(.16)
Founder gender	.07***	(.02)	1.09	(.11)	1.10	(.11)	.06	(.12)	.06	(.12)
Founder immigrants	.00	(.03)	1.56**	(.22)	1.56**	(.22)	-.28	(.33)	-.27	(.33)
Minimum of two founders and two employees	.03**	(.01)	.90	(.05)	.93	(.05)	.77***	(.11)	.75***	(.10)
Endogeneity correction										
Kin			.20	(.17)	.24	(.22)	-.09	(1.38)	.15	(1.45)
Residual			3.34	(2.9)	3.63	(3.15)	.30	(1.41)	.21	(1.43)
Instrument										
Siblings of founders or spouses	.02***	(.00)								
Constant	8.39	(4.85)					734.03***	(34.48)	732.29***	(34)
Log likelihood/R-squared [b]	-311.36		-16701.96		-16698.45		.20		.20	

[a] There are 4,967 observations for all of the models. [b] Log likelihoods are reported for the first stage (generalized linear model) and survival models (competing-risk regressions), while *R*-squared is reported for sales models (linear regression). Robust clustered (industry) standard errors are in parentheses. Two-tailed tests. * $p < .05$, ** $p < .01$, *** $p < .001$. All models include year founded and industry fixed effects. For competing-risk regressions (Survival), 4,967 subjects are split as 2,066 failed, 27 competing and 2874 censored subjects. For an explanatory variable, if the hazard rate (i.e., the coefficient we report) is lower than 1, the baseline, this suggests that the variable lowers the failure rate, whereas if the hazard rate is greater than '1,' the baseline, this suggests that the variable accelerates failure.

Table 3b: Tests of Differences between Kin Structures on Performance (H2a, H2b, H2c) [a]

	Survival Model 1	Sales Model 2
H2a: Horizontal employee kin > Vertical founder–employee kin	*Chi = 10.25* *p = .00* *(supported)*	*F = 14.57* *p = .00* *(supported)*
H2b: Horizontal employee kin > Horizontal founder kin	*Chi* = 3.41 *p* = .07 (marginally supported)	*F = 5.92* *p = .02* *(supported)*
H2c: Horizontal founder kin > Vertical founder–employee kin	*Chi = 4.56* *p = .03* *(supported)*	*F = 11.83* *p = .00* *(supported)*

[a] Two-tailed tests of the differences between the coefficients of the variables in Models 3 and 5 in Table 3a are presented in Models 1 and 2 respectively.

Table 4: Seven Exhaustive and Mutually Exclusive Structural Categories Disaggregated

Variable	Model 1: Survival		Model 2: Sales	
	Haz.	s.e.	Coeff.	s.e.
Theory variables				
Horizontal founder kin (no prediction)	.83	(.13)	.19	(.15)
Horizontal employee kin (H1a: positive)	**.62****	**(.09)**	**.36*****	**(.09)**
Vertical founder–employee kin	.93	(.12)	-.19	(.19)
(H1b: negative)				
Horizontal founder and vertical founder-emp.	.66*	(.11)	.18	(.20)
Horizontal emp. and vertical founder-emp.	.63*	(.12)	.28	(.16)
Horizontal emp. and horizontal founder	1.15	(.20)	.04	(.62)
All three kin types	.56*	(.16)	.25	(.24)
Control variables				
Opportunity cost founders	1.00	(.01)	-.01	(.00)
Opportunity cost of employees	.99	(.01)	.06***	(.01)
Number of employees	.97***	(.01)	.09***	(.01)
Founder size	1.00	(.01)	-.05	(.03)
Founder prior occupation	.74**	(.08)	.45**	(.14)
Founder new firm experience	1.15	(.09)	-.20	(.14)
Founder parent new firm experience	1.32	(.20)	-.37	(.23)
Founder spouse new firm experience	1.26*	(.12)	.00	(.15)
Founder age	100	(.00)	.00	(.00)
Founder education	1.00	(.02)	-.03	(.04)
Employee gender	1.06	(.1)	-.06	(.19)
Employee immigrants	.87	(.13)	-.27	(.15)
Founder gender	1.10	(.11)	.06	(.12)
Founder immigrants	1.55**	(.22)	-.28	(.33)
Minimum two founders and two employees	.92	(.06)	.76***	(.10)
Endogeneity correction				
Kin	.31	(.25)	-.34	(1.52)
Residual	3.68	(3.21)	.26	(1.45)
Constant			737.4***	(34.76)
Log likelihood/R-squared [b]	-16694.25		.20	

[a] There are 4,967 observations for all of the models. [b] Model 1 contains the competing-risk regressions and Model 2 predicts sales. Log likelihoods are reported for Model 1 and *R*-squared values are reported for Model 2 (linear regressions). The robust clustered (industry) standard errors are in parentheses. Two-tailed tests: [*] $p <$ .05, [**] $p < .01$, [***] $p < .001$. All of the models include year founded and industry fixed effects. For the competing-risk regressions (Model 1), 4,967 subjects are split into 2,066 failed, 27 competing, and 2,784 censored subjects. For the explanatory variable, if the hazard rate (i.e., the coefficient we report) is lower than 1, the baseline, the variable lowers failure rate, whereas if the hazard rate is greater than 1, the variable accelerates failure.

Table 5: Number of Employees as a Moderator [a]

Variable	Horizontal founder kin M1: Survival		M2: Sales		Horizontal employee kin M3: Survival		M4: Sales		Vertical founder–employee kin M5: Survival		M6: Sales	
	Haz.	s.e.	Coeff.	s.e.	Haz.	s.e.	Coeff.	s.e.	Haz.	s.e.	Coeff.	s.e.
Theory variables												
Horizontal founder kin	.90	(.17)	-.18	(.18)	.70	(.14)	.06	(.17)	.73	(.14)	.03	(.15)
Horizontal employee kin	.56**	(.11)	.44	(.24)	.59	(.16)	.50	(.33)	.63*	(.13)	.40	(.23)
Vertical founder–employee kin	1.28	(.31)	-1.21***	(.31)	1.16	(.29)	-1.17***	(.31)	1.83	(.58)	-1.45**	(.46)
Horizontal founder kin X Number of emp.	.93	(.05)	.06	(.04)								
Horizontal employee kin X Number of emp.					.96	(.05)	.00	(.05)				
Vertical founder-emp. kin X Number of emp.									**.77***	**(.08)**	.14	(.14)
Control variables												
Opportunity cost founders	1.00	(.01)	-.01	(.00)	1.00	(.01)	-.01	(.00)	1.00	(.01)	-.01	(.00)
Opportunity cost of employees	.99	(.01)	.06***	(.01)	.99	(.01)	.06***	(.01)	.99	(.01)	.06***	(.01)
Number of employees	.97***	(.01)	.10***	(.01)	.97***	(.01)	.10***	(.01)	.97***	(.01)	.09***	(.01)
Founder size	1.00	(.01)	-.05	(.03)	1.00	(.01)	-.05	(.03)	1.00	(.01)	-.05	(.03)
Founder prior occupation	.74**	(.08)	.44**	(.14)	.74**	(.08)	.44**	(.14)	.74**	(.08)	.44**	(.14)
Founder new firm experience	1.15	(.09)	-.21	(.14)	1.15	(.09)	-.20	(.14)	1.14	(.09)	-.20	(.14)
Founder parent new firm experience	1.32	(.19)	-.36	(.23)	1.32	(.20)	-.37	(.23)	1.32	(.19)	-.36	(.24)
Founder spouse new firm experience	1.25*	(.12)	.01	(.15)	1.26*	(.12)	.01	(.15)	1.26*	(.12)	.01	(.15)
Founder age	1.00	(.00)	.00	(.00)	1.00	(.00)	.00	(.00)	1.00	(.00)	.00	(.00)
Founder education	1.00	(.02)	-.03	(.04)	1.00	(.02)	-.03	(.04)	1.00	(.02)	-.03	(.04)
Employee gender	1.06	(.10)	-.06	(.18)	1.06	(.1)	-.07	(.18)	1.05	(.10)	-.06	(.19)
Employee immigrants	.87	(.13)	-.28	(.16)	.87	(.13)	-.27	(.16)	.87	(.13)	-.28	(.16)
Founder gender	1.10	(.11)	.07	(.12)	1.10	(.11)	.06	(.12)	1.10	(.11)	.07	(.12)
Founder immigrants	1.56**	(.22)	-.26	(.33)	1.56**	(.22)	-.27	(.33)	1.55**	(.22)	-.26	(.33)
Minimum two founders and two employees	.93	(.05)	.75***	(.10)	.92	(.05)	.75***	(.10)	.93	(.05)	.74***	(.10)
Endogeneity correction												
Kin	.23	(.21)	.15	(1.45)	.25	(.23)	.15	(1.46)	.24	(.22)	.09	(1.47)
Residual	3.50	(3.04)	.27	(1.43)	3.64	(3.16)	.21	(1.43)	3.57	(3.08)	.28	(1.46)
Constant			732.88***	(33.8)			732.29***	(33.94)			734.47***	(34.07)
Log likelihood/R-squared [b]	-16697.76		.20		-16698.28		.20		-16696.31		.20	

[a] There are 4,967 observations for all of the models. [b] Models 1, 3, and 5 are competing-risk regressions, while Models 2, 4, and 6 predict sales. Log likelihoods are reported for the competing-risk regressions, and *R*-squared values are reported for the linear regression models. Robust clustered (industry) standard errors are in parentheses. Two-tailed tests: $^{*} p < .05$, $^{**} p < .01$, $^{***} p < .001$. All of the models include year founded and industry fixed effects. For the competing-risk regressions (Model 1), 4,967 subjects are split into 2,066 failed, 27 competing, and 2,874 censored subjects. For the explanatory variable, if the hazard rate (i.e., the coefficient we report) is lower than 1, the baseline, the variable lowers failure rate, whereas if the hazard rate is greater than 1, the variable accelerates failure.

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