

COMPETITIVE IMPLICATIONS OF INTER-FIRM MOBILITY

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ABSTRACT

This paper examines the competitive consequences of inter-firm mobility. Since the loss of key members (defined as top decision-makers) to competing firms may amount to a diffusion of a firm's higher order routines, we investigate the conditions under which inter-firm mobility triggers this event. In particular, we focus on: (1) when inter-firm mobility entails groups rather than single individuals; (2) when outbound members found a new enterprise rather than joining an existing competitor; and (3) when members in the destination firm shares the same context as in their prior firm. To address these questions, we examined membership lists pertinent to the Dutch accounting industry to study key member exits and firm dissolutions over the period 1880–1986. We exploit information on the type of membership migration and the competitive saliency of the destination firm as inferred from the recipient status (incumbent vs. start-up) and its geographic location (same vs. different province). The dissolution risk is highest when collective inter-firm mobility results in a new venture within the same geographical area. The theoretical and normative implications of this study are discussed.

Key words: Inter-firm Mobility, Routines replication, Competition.

1. INTRODUCTION

The recruitment, development and retention of employees are central factors for organizational survival. While the focus on people as a source of superior performance is hardly new (e.g., Penrose 1959, Pfeffer 1994, Grant 1996), “people” has recently become even more salient on the grounds that a firm’s stock of routines is enacted by its members (Cyert and March 1963, Nelson and Winter 1982, Coff 1997). Not surprisingly, recruiting individuals from rival organizations has been increasingly used to access resources and routines not available in-house (see Rao and Drazin 2002). Likewise, firms attempt to limit outbound movement of members to competing firms (Coff 1997).

Much of the theory and research to date has focused on the *antecedents* of turnover with general inquiries on voluntary turnover (e.g., for a review see Williams and O’Reilly III 1998). Inquiries on possible turnover *consequences* have revolved around the impact on the transferring member’s performance (Harris and Helfat 1997; Huckman and Pisano 2005). Another subset of research studies has examined cases of turnover limited to inter-firm mobility, and their consequences for the source firm (Sørensen 1999), the destination firm (Agarwal et al. 2004, Rao and Drazin 2002), or both the source and destination firm (Phillips 2002). Evidence suggests that spin-offs are quicker than *de-novo* firms in mobilizing resources and becoming operational (Ruef 2005), tend to replicate or modify an idea encountered through their previous employment history (Bhide 1994) and, on average, exhibit higher survival rates. In their study of the U.S. commercial laser industry, Klepper and Sleeper (2005) have further confirmed that spin-offs inherit knowledge from their parents. The rationale of these studies is that members moving to a peer firm bring along not only their skills and experience (McKelvey 1982, Boeker 1997, Rao and Drazin 2002), but also those organizational routines in which they have played a part (Phillips 2002).

Despite this large body of research, several issues remain unresolved. Many studies assume that inter-firm mobility entails the transfer of resources and routines without any further qualification. However, resources and routines are distinct and so are the conditions under which they can be successfully transferred. As they move from firm to firm, members bring along their human and social capital. But the extent to which they can replicate existing routines in the destination firm is less obvious because routines are less dependable on single individuals. Previous

studies treat such behavioural templates as homogeneous and do not distinguish between high-order and operating routines. This distinction is particularly important for explaining the competitive implications of inter-firm mobility. Lower order routines are decomposable and portable (Baldwin and Clark 2002) and readily replicated across time and space. By contrast, higher order routines attend to the creation and coordination of lower level routines as well as organizational resources (Dosi, Nelson and Winter 2000, Winter 2000, Zollo and Winter 2002) and remains unclear whether their value can be captured in the destination firm (see Edmonson, Bohmer and Pisano 2001). In short, previous research has failed to properly articulate the conditions facilitating the preservation of routines when replicated inter-organizationally.

This paper explicitly addresses these issues by studying the competitive implications for the donor organization produced by the replication of higher-order routines due to inter-firm mobility. Successful replication of these routines due to outbound movements hinges on the preservation of their integrity in the destination firm. Based on the definition of routines adopted in this paper (see below), three sets of distinct but interdependent conditions conducive to routine replication are spelled out. First, replication is more likely to succeed when organizational members leave as a group, and even more so if they have worked together for an extended time. Second, organizational members have more freedom in replicating routines when leaving and starting a new venture than joining an incumbent already endowed with a well-engrained set of routines. Finally, successful replication is a function of the co-location of the two firms as routines embody both organization- and context-specific characteristics. As successful replication increases the competitive interdependence between organizations, this study sheds light on the competitive implication of routine replication due to inter-firm mobility.

The present study analyzes the entire population of Dutch accounting firms over the period 1880-1986. As the concern is with higher-order routine replication due to inter-firm mobility, our focus is on the departure of so-called “key” members, i.e., members with decision-making authority (e.g., members of the board of directors, or senior partners). Following previous research arguing that the degree of routines transferred to another firm is a function of departing individuals’ position or rank in the origin firm (Phillips 2002), we track the departure of partners, disregarding exits of

other members, such as associates, whose participation in the creation of higher order routines is much less critical. Other forms of turnover, including death, retirement or transfer to a non-rival firm (e.g., a client) are rather inconsequential in competitive terms. Such turnover is unlikely to engender replication of organizational routines in rival firms, which is the focus of this paper.

The paper is organized as follows. Section 2 presents the theory and its four hypotheses. Section 3 describes the study's empirical setting, data, and independent and control variables. Section 4 explains the motivation behind the models estimated and the method employed to test the hypotheses. Section 5 presents the results. We conclude by discussing the main implications of the findings and identifying important topics for future research (Section 6).

2. THEORETICAL BACKGROUND

We start with the premise that inter-firm mobility may produce a transformation of a firm's competitive surroundings. Previous studies showed how personnel outflows might increase similarity of both routines and resources across organizations (Boeker 1997, Sørensen 1999, Phillips 2002) and, by implication, their competitive interdependence. In this paper we concern ourselves only with the competitive implications occasioned by organizational routines replication resulting from inter-firm mobility. The focus is on routines because resources such as human and social capital are typically attached to individuals. Even when resources are firm-specific and therefore less valuable in a different context, members may bring them along as they move from firm to firm.

By contrast, successful replication of firm-entrenched routines is a less obvious outcome of inter-firm mobility. Routines usually originate from repeated interaction among multiple actors inside and/or outside the firm over an extended period of time, which render them less sticky to single individuals. As a result, the odds of success at replicating them are contingent on a much broader range of conditions to be satisfied. Previous research showed how existing routines are more effectively transferred between a firm and its offspring or progeny (Phillips 2002, Klepper 2001). But this is just one condition facilitating their replication. This requires us to elaborate on the mechanisms that allow preserving their integrity and value in a different context than the one in which they originally developed. The present paper moves beyond existing research on the

competitive implications of inter-firm mobility, precisely because it provides an effort to embrace a whole set of interdependent conditions rooted in the definition of routines.

Routines are hierarchical in their configuration. Their categorization has followed their ordering from operational to meta-routines (Cyert and March 1963, Nelson and Winter 1982). While the former dictate day-to-day firm behavior, the latter refer to the managerial discretion to coordinate, integrate and deploy resources throughout the organization (see Knott 2001). Higher order routines “govern” the use, combination or recalibration of lower order ones (Nelson and Winter 1982, Teece, Pisano and Shuen 1997). This integrative role renders higher order routines readily transferable when moved by groups rather than individuals. Such view is in line with Nelson and Winter (1982: 105) who underscored that “[T]o view organizational memory as reducible to individual member memories is to overlook, or undervalue, the linking of those individual memories by shared experience in the past, experiences that have established the extremely detailed and communication system that underlies routine performance.” When people migrate to other firms, therefore, the propensity to replicate routines will be higher as they move with peers who have experienced similar histories and display equivalent cognitive dispositions.

Building on this insight, we claim that three conditions significantly affect the efficacy of higher-order routine replication and its impact on the donor’s performance. First, it is important to distinguish between solitary versus group migrations of members. Next, since existing organizations soon after their birth become imprinted with high-order routines that are unlikely to be modified during their existence (see Baron et al., 1996), we should examine how the classification of the destination firm—established or entrepreneurial—impedes or facilitates that routine transfer. Finally, as a partial “replica” of the donor firm, the competitive fall-out will be more intensive if that replica resides in the same environment. That is because the firm with reproduced template is more likely to secure resources (e.g., funding, employees, goodwill) that mirror those of the donor.

2.1. Inter-firm Mobility: Individual vs. Collective Replication

Following Cohen and Bacdayan (1994: 555), routines can be defined as “patterned sequences of learned behavior involving multiple actors who are linked by relations of communication and/or

authority.” For instance, landing a commercial aircraft is a highly standardized but complex task, involving multiple actors performing interconnected subtasks requiring proper coordination. One cannot fully understand how that routine actually works by examining only the pilot’s part (Cohen and Bacdayan 1994: 555). Routines depend on “the connections, the stitching together of multiple participants and their actions to form a pattern that people can recognize and talk about as a routine” (Pentland and Feldman 2005: 6). They are, therefore, anchored in the context or social network of actors, whether internal or external to the firm, whose behavior they govern.

Replication varies depending on whether routines are operational or meta-routines. This view fits that of Cyert and March (1963) and Nelson and Winter (1982) who elaborated on a dual routines perspective, where organizational behavior stems from two sets of hierarchically ordered routines: a set of operational routines that control day-to-day actions and a set of meta-routines that govern operational routines (see Knott 2001). Meta- or higher order- routines lie at the core of managerial intervention. They entail learned sequences of conduct regarding governance, idiosyncratic, procedural knowledge of the competitive environment and organization of work flows -- in short, the arrangement and coordination of firm activities (Teece et al. 1997, Henderson and Cockburn 1994). Their directive role and involvement of people and processes permeate the behavior of the entire organization. In this respect, higher order routines are holistic in their use and are harder to replicate than atomistic or modular ones such as those associated with operational tasks like sales, production and other functional activities. Furthermore, higher order routines are inherently social and success of replication hinges on retention of their integrity.

Being socially constructed, higher order routines transcend individual skills. That is why several authors (e.g., Kogut and Zander 1992, Levitt and March 1988, Nelson and Winter 1982) have argued that turnover does not necessarily compromise the integrity of existing routines and firm performance, on the premise that organizational routines are independent from individuals (but for a more comprehensive review see Felin and Foss 2005). Empirical research has likewise shown that routines are strongly embedded in the behavior and cognition of organizational members (Song, Almeida and Wu 2003): when migrating elsewhere, those very individuals could replicate previously developed routines. Therefore, inter-firm mobility may lower the donor’s firm performance through

the leakage of proprietary routines as a result of the migration of members who have internalized the donor firm's legacy. Successful transfer of routines to another firm is also a function of the position or rank of a departing individual in the origin firm. As Phillips (2002: 476), for instance puts it, the "more critical the potential founder's position is, the more likely that the parent organization's resources and routines will be affected as that founder exits to entrepreneurship."

However, since routines usually involve multiple actors, whether internal or external to the firm, their replication in other firms depends on preserving existing patterns of interaction among those actors (Nelson and Winter 1982). The ability to preserve their integrity, and thereby their successful replication, is diminished when organizational members leave alone. This also accords with the finding from a study showing that surgeons' performance declines when they try to move their *individual* skills set towards other hospitals (so-called "splitting" of membership): existing surgical routines combine with hospital-specific cultural and institutional elements to produce well integrated operation room teams of medical personnel (Huckman and Pisano 2005). When ported into other organizations, those routines become dislodged and produce comparatively inferior post-operative results – i.e., higher patient mortality.

Yet, when *groups* rather than individuals export their routines, the tacit coordination and alignment of any replication is more readily attained (see Edmondson, Bohmer and Pisano 2001). Individuals are only partially engaged in the firm's bundle of routines because their skills are complementary with those of their colleagues. In contrast, collective departure is more conducive to holistic replication since pre-existing systems of coordinated roles can be maintained. Successful replication of routines therefore is contingent on whether mobility entails groups or single individuals. If a group of members departs together for a new firm, its routines can be transferred with greater integrity and at greater risk to the source firm. Accordingly, we hypothesize:

H1: *The risk of organizational dissolution is higher when key members leave collectively rather than individually.*

Although collective movements engender successful replication, not all groups are homogeneous. Groups vary along dimensions that affect successful routine transfer across organizational

boundaries. Member homogeneity hinges on shared internalization of routines among individual members. The accumulation of a common mindset is subject to time compression diseconomies as compliance with or attachment to certain routines depends on the amount of time spent together. Central to the present perspective is both the notion of repeated interaction among actors and the idea that this interaction must unfold over an extended period of time. Our main argument is that shared experience allows overcoming two of the most critical issues associated with liability of newness (Stinchcombe, 1965): organizational roles and standard routines to solve problems are already developed and readily usable.

As members have been congealed into a common mindset, they will preserve their stock of routines and therefore stand a better chance at replicating them. The longer the departing members have kept company the more likely they are to subscribe to a common logic and a well-institutionalized template. This argument is consistent with empirical research on the relevance of team cohesiveness in building group coordination and trust. Eisenhardt and Schoonhoven (1990), for example, examined 102 start-ups in the semiconductor industry and found that prior joint work experience increased sales growth. The authors attributed their findings to the notion that within these strong teams “[E]xecutives who have a history together have probably learned how to get along and communicate with each other” (p. 509). Ruef and his co-authors (2003) similarly found that trust and familiarity are more critical to founding team composition than are complementary skill sets. The implication is that under conditions of collective out-migration, members having spent a significant amount of time together manifest better odds of successful replication. We hypothesize:

***H1a:** The risk of organizational dissolution due to collective exit is higher the longer departing members have spent time together before turning over.*

2.2. Member Exit and Firm Destination: Start-ups vs. Incumbents

Prior research has shown that individuals formerly employed by established firms often start new ventures (Freeman 1986, Burton, Sørensen and Beckman 2002). This phenomenon is common to both high-tech (Braun and MacDonald 1978, Klepper and Sleeper 2000, Agarwal et al. 2004) and

service (Phillips 2002) industries. Replication of routines by a start-up typically results in a more reliable and authentic copy of routines than replication by an existing firm. Departing members enjoy less leeway in transferring existing routines from other firms when they join an incumbent with an established set of routines. The competitive implications of routines replication, we argue, are bound to be more harmful when the source firm is new and not yet endowed with such institutionalized practices. The reason is that high-order routines become imprinted during early stages of the organizational life cycle and shape future actions and behaviors (see, e.g., Baron et al. 1996).

Knowledge stored in individual memories is “meaningful and effective only in some context” (Nelson and Winter 1982: 105). Lacking the conditions that prompted the emergence of certain routines, the routines’ reproduction might be severely compromised. Using a genealogical framework, Phillips (2002), showed how members who leave an existing organization (parent) to found a new venture (progeny) within the same population are more likely to transfer resources and to replicate routines from their former employer. As they are not constrained by pre-existing patterns of interaction in the destination firm, those members enjoy more latitude in re-creating conditions similar to those of the source firm. As a result, the parent organization’s blueprint will “carry over to the new organization through the career experiences of the offspring’s founders” (Phillips 2002: 474). Similarly, the literature on spin-offs (e.g., Bhide 2000, Agarwal et al. 2004, Klepper and Sleeper 2005) has shed new insights on the role of departing members for the build-up of a new firm. Since spin-offs exploit their parents’ knowledge to offer products or services similar to those of their parents they are competitively more threatening. They are in fact more likely to overcome the problems associated with liability of newness (Stinchcombe, 1965) because routines, but also other resources such as social relations, trust and stable ties, can be carried from the parent firm. As Agarwal and her colleagues (2004: 501) noticed, “[S]pin-outs pose a special threat to incumbents since they can capitalize on knowledge gained from discoveries made during the course of their founders’ employment in the incumbent firm.”

Unlike start-ups, established firms exhibit already an array of routines. As routines – especially higher-order ones – become imprinted in organizations early on (Stinchcombe 1965), any incumbent recipient exhibits a pattern of interaction producing resistance against the import of

extramural routines. Internal resistance is likely to ensue because transferring routines from another firm might jeopardize the functioning of routines in the destination firm by questioning what Nelson and Winter call the “truce” – i.e., the presence of an implicit understanding reducing the conflict between the divergent interests among organizational members. Attempts at replicating routines from another source may undermine the truce and require new processes and objectives, together with re-establishing a political equilibrium among the membership (Nelson and Winter, 1982). In the case of newly founded firms, no truce is under threat and the replication of routines does not face any internal resistance. It is therefore plausible to expect successful transfer of existing routines to be *more likely* if the host organization is an entrepreneurial rather than an existing firm—and by implication to observe greater harm to the source firm. We thus hypothesize:

H2: *The risk of organizational dissolution due to key members’ inter-firm mobility is higher when the recipient firm is a newly founded rather than an incumbent firm.*

2.3. Member Exit and Spatial Routines Replication

Collective turnover and start-ups as destination are conditions conducive to routine replication. The departure of organizational members however takes on a rather different significance depending on the degree of similarity in location between the source and the destination firms. Replication of routines is context-dependent in that the actors whose conduct reflects the enactment of routines are institutionally embedded. As Nelson and Winter (1982: 125) put it “[A] routine may involve extensive direct interactions with the organization's environment and the making of numerous 'choices' that are contingent both upon the state of the environment and the state of the organization itself?”. While geographical proximity is recognized as an important condition for routine replication, it becomes relevant only if proximity implies similarity in the broader organizational context. To put it differently, it is not physical distance per se that matters, but whether that distance corresponds to historical, socio-economic and institutional differences. Previous research has showed the existence of significant historical, socio-economic and institutional differences across spatially proximate locations (see e.g., Putman 1996, Linz and de Miguel 1966).

As this stream of research suggests, the replication of routines due to inter-firm mobility among co-located firms is more likely to succeed when they share the same context. This line of reasoning is consistent with Stinchcombe's (1965) original insights. As Lounsbury and Ventresca (2002: 21) recently recognized, "Stinchcombe focuses on the capacity for new organizations to develop new roles and routines that vary based on the distribution of generalized skills outside an organization, the initiative of employees in the labor force, the degree of trust among workers based on competence in work roles." Because we defined routines as sequences of learned behavior involving multiple actors both internal and external to the firm, we expect institutions, customers and competitors to significantly shape them. When actors share the very same context, existing patterns of interaction, including relations of communication and/or authority relations, among such actors become geographically embedded.

The connection between routines and their context has been emphasized in recent theorizing on the origins of organizational capabilities, defined as high-level or meta-routines (Winter 2000). In elaborating on capability learning, for instance, Winter (2000: 982) asserted that meta-routines are meaningful only "in relation to a particular competitive context" and "are wired directly to the environment" (Winter 2000: 983). This line of reasoning seems also to be consistent with the insights of ecological research (Hannan and Freeman 1977, Hannan and Freeman 1984) whose framing of inertia implies a close correspondence between the organizational routines and the broader institutional and historical, not merely competitive, context. The same bundle of routines which enhances the fit between the organization and its external environment might prove of little value when applied to a different one. The implication is that successful replication, and its associated competitive threat, is contingent on whether or not the donor and recipient organizations share the same context. Accordingly, we hypothesize:

H3: The risk of organizational dissolution due to key members' outbound movement is higher when they migrate to co-located competitors which share the same context.

These three dimensions—collective vs. individual, start-up vs. incumbent, same vs. different context—can generate diverse survival consequences for source firms, i.e., firms that are subject to member turnover. For instance, while the movement of groups of key members harms survival, this effect varies with the destination firm being new or established, or sharing the same environment. A complete appreciation of the survival consequences of inter-firm mobility requires considering all three conditions jointly.

Inter-firm mobility should have greater negative survival consequences when the departure of members amounts to a collective rather than an individual act and results in an entrepreneurial rival residing in the same competitive environment. Groups of members that move to newly founded firms exhibit substantial discretion in replicating previously acquired routines, especially within the same context. With any other combination of these three dimensions (e.g., the rival is located in a different environment, or is an established firm, or the departure involves a single member), the competitive effects of inter-firm mobility diminish. We thus hypothesize:

***H4:** The risk of organizational dissolution due to inter-firm mobility is highest when key members leave in groups to start a new firm in the same context.*

3. EMPIRICAL SETTING

To test our hypotheses we traced the composition of the Dutch accounting industry over the period 1880-1986. In line with more recent studies using data on this industry (see, for instance, the resource partitioning study on the Dutch newspaper industry by Boone, Carroll and van Witteloostuijn 2002), we divided the overall population of accounting firms into 11 sub-populations, each corresponding to a different province. Our rationale is that each province represents a *distinct selection environment*. Cattani, Pennings and Wezel (2003) offer a detailed discussion of the historical, socio-economic and institutional factors making provinces the appropriate unit of analysis to study how spatial heterogeneity affects organizational founding rates within each sub-population. We argue that the same factors and geographical boundaries are critical for the likelihood of replicability of existing routines across organizations. As organizations and their routines are designed to match a

specific environment, successful replication is contingent on the degree of similarity between the origin and the destination environments.

Over the period spanned by our study (i.e., 1880-1986), the Netherlands, the setting of the current study, comprised eleven provinces: North Holland, South Holland, Fryslan, Groningen, Drenthe, Overijssel, Gelderland, Utrecht, North Brabant, Zeeland and Limburg. In the 17th century, the seven Northern provinces included autonomous regions held together through a confederation, called “The Republic of the United Provinces.” Perhaps it was the extraordinary degree of autonomy and home rule that accounts for the disinclination of provinces to secede. Such autonomy further engendered their unique socio-economic identity. Two of the three southern provinces, very much like Italy’s *mezzogiorno*, are located below the Rhine and the Meuse rivers and were ruled partly by the Republic and partly by Spain and Austria. Although those provinces showed a delayed economic development as compared to the northernmost provinces, presently they are part of the “European Banana” stretching from Greater London to Reggio Emilia and exhibit patterns of development that are comparable to European standards.

Apart from history, the provinces vary in soil structure, geology, religion, economic development, urbanization, and language or dialect (Frysk is an officially recognized language, spoken in the northern province of Fryslan, while provinces like Groningen, Zeeland and Limburg speak a sub-language or dialect. When speaking the local language, inhabitants from other provinces would not be able to communicate. The provinces are not “merely” administrative units but also historically, culturally, institutionally and economically distinct entities. Historically, provinces are path dependent in their socio-economic developments, endowed with unique socio-economic legacies to which locally active accounting firms have become attached and which further evolved into geographically defined ‘strategic’ groups. The idiosyncratic historical path to industrialisation which Dutch provinces took has generated a distinctive pattern of regulating social groups which continues to influence the evolution of individual firms as well as entire industries. Altogether we believe that these reasons justify our choice of mapping the geographical dimension along a dichotomous indicator (within/outside province) rather than using a continuous measure (i.e., distance in kilometres).

3.1. Data

The data we use in this paper are similar to those that Pennings et al. (1998) analyzed in their study on the effect of organization-level changes in human and social capital on firm dissolution. Since our observation period ends in 1986, our initial population is also smaller than that examined by Boone et al. (2000), whose study extends until 1992. We further eliminated single proprietorships from our risk set ending up with a population of 676 organizations. We collected information on the name, address and status (partner or associate) of individual professional accountants, and also on the name and address of individual organizations, from the membership lists and directories of accountant associations, which were published at intervals varying from every year to every five years. More precisely, the frequency (in %) of 1-, 2-, 3-, 4-, and 5-year intervals are 24%, 60%, 6%, 8%, and 2%, respectively. These larger gaps in data challenged our mapping of the effects of inter-firm mobility on organizational dissolution. However, as explained below in the model section, in our analyses we controlled for the variance in interval length by creating a variable accounting for diverse time spans. We reconstructed the histories of individual organizations by first aggregating individual level data to the firm level. The data cover the entire population of Dutch accounting firms over the period 1880–1986.

Following Boone et al. (2000) and Phillips (2002), we define dissolution as exit from the market without distinguishing between bankruptcy and merger or acquisition. Our choice is motivated by the fact that “failure, in the sense of bankruptcy, cannot be observed in the audit industry and, therefore, cannot be distinguished from other types of exit” (Boone et al. 2000: 368). Thus, organizational dissolution encompasses different types of exit, ranging from the case in which a firm disappears because its owners are no longer listed in the Certified Professional Accountant directories, to the case of dissolution by acquisition or merger. In all such cases, we coded our dichotomous dependent variable as 1 and removed the firm from the risk set. Since the industry became more concentrated in the late 1960s in the wake of intense M&A activity, we checked whether our results might be affected by our broad notion of dissolution. We conducted a sensitivity

analysis including only the data up to and including 1966. The results obtained remain similar to those presented in the paper.

Accounting firms are stratified, consisting of partners and associates. In the analysis we investigated the inter-firm mobility events involving only partners because they usually possess superior replication potential (if only because they have been around longer and have successfully completed the tournament to partnership). The competitive effects of higher-order routine replication should therefore be higher when departure of organizational members involves partners rather than associates. Within accounting firms, partners serve as producer-managers by actively participating in the business as key production workers (Maister 1993). Unlike shareholders of large corporations, partners are also responsible for the overall management. Their decision-making power extends to the task of building/changing routines, such as those dealing with hiring and firing policies, procuring work and deploying junior professionals, differentiation (i.e., to hedge against market shrinkage), investment, personal financial planning, and liability insurance premium decisions (for more details see Maister 1993). Being owners, partners enjoy more latitude in the transfer of organizational routines. This latitude of freedom is much larger in newly founded firms because partnership agreements strictly define the criteria of succession (e.g., setting the voting rights of partners for the transition) and the principles behind the successor's management.

3.2. Independent Variables

We tested our hypotheses by distinguishing inter-firm mobility according to the three dimensions suggested by our theory: (i) joint group experience, (ii) type of destination: incumbent or a newly founded organization, (iii) location of destination: same province or different province. Our assumption is that spin-offs are stronger competitors because they are quicker in mobilizing resources, becoming operational (Ruef, 2005) and, in general, overcoming the liability of newness (Stinchcombe, 1965). The conditions under which they pose a competitive threat to the donor firm, however, are likely to vary. Our theoretical reasoning suggests that inter-firm mobility affects the source firm's survival chances more strongly when partners leave collectively (Hypothesis 1). We thus created two dummy variables flagging whether the event under study involved individual (*Individual-*

Exit) or collective (*Group-Exit*) cases of inter-firm mobility. We defined a Group as consisting of two or more partners who leave their employer and wind up working together for another firm, whether an incumbent or a start-up.

We carried out the test concerning the potential of the group to replicate existing routines by counting the average number of *years that the departing members spent together* before their exit. Our choice of this variable is rooted into existing research that shows how joint experience improves cohesion, trust, efficacy of communication among team members and, in turn, start-ups success (Eisenhardt and Schoonhoven 2000, Zenger and Lawrence 1989). While in any given interval a firm might lose several partners who exit individually, we typically observe only one collective departure in any given year. For each firm, our data do not display two or more groups of defecting partners during the same year, but more than one partner may leave to start up a new venture or join a competitor. Since higher-order routines typically involve multiple actors linked by patterns of communications and interaction, the ability to preserve their integrity as well as replicate them in a different context is diminished when a partner leaves alone. Although the number of partners leaving individually also represents a loss of valuable human and social capital for the focal firm (and we control for this effect in the analysis), our theory suggests that the degree of competition faced by the donor is proportional to the stock of experience shared by the defecting members. Following this logic, we tested Hypothesis 1a by creating a measure of the (logged) average joint experience of defecting members. We also ran the analysis using the minimum number of years organizational members spent together before leaving as a group. The average might confound the case where just a few group members worked together for a long time, while the others only for a few years, with the case where, on the contrary, all group members almost always worked together. Thus, even if the average joint experience could be the same in both cases, the situation would of course be significantly different: in the latter case group members most likely contributed to the creation of (and therefore would be sharing) the same bundle of routines. Since in our data groups typically consist of partners who worked together most of the time before leaving, the results do not depend on whether we use the average or the minimum number of years.

The average joint experience was then disaggregated in several ways to test the remaining hypotheses. To test Hypothesis 2 we distinguished between the average experience of departing members founding a new venture (*Average-Joint-Experience-To-New-Firm*) and the average experience of departing members joining an existing firm (*Average-Joint-Experience-To-Incumbent*). As before, since we presume that the effect of the joint experience of departing members increases organizational dissolution at a decreasing rate, we log-transformed each member exit variable. To test Hypothesis 3, we distinguished between the (logged) average joint experience of partners moving to a firm located within the same province as the source firm (*Average-Joint-Experience-To-Local-Firm*) or a different one (*Average-Joint-Experience-To-Non-Local-Firm*).

The ultimate question to be addressed, however, is how these three forces jointly shape organizational survival. We predicted that the competitive effects of inter-firm mobility are stronger when collective rather than individual departures lead to a new venture in a geographical area similar to that of the source firm. Accordingly, we sorted the average experience of departing members along four different combinations to test Hypothesis 4. In particular, we distinguished between (i) the (logged) average joint experience of organizational members leaving as a group to found a new venture located within the same (*Average-Joint-Experience-To-Local-New-Firm*) or a different (*Average-Joint-Experience-To-Non-Local-New-Firm*) province; and (ii) the (logged) average joint experience of organizational members leaving as a group to work for an incumbent firm located within the same (*Average-Joint-Experience-To-Local-Incumbent*) or a different (*Average-Joint-Experience-To-Non-Local-Incumbent*) province. Because all the above variables can take on the value of zero we log-transformed them after adding 1 to their base value. Finally, to reinforce our causal inferences, we lagged all the independent variables by one observation period.

3.3. Control Variables

In the final model we included several control variables—at the organizational, historical, and provincial levels—to rule out a number of competing hypotheses.

Organizational controls. A crucial alternative hypothesis concerns internal disruption. Since internal disruption of routines should take place in presence of any type of turnover, we controlled for turnover events that represent exit from the sector (i.e., death, retirement or joining a non-accounting firm such as a client organization) by creating the (logged) variable *Other-than-Inter-firm-Mobility*. Our theory suggests that the replication of higher-order routines is a distinct phenomenon from the transfer of (human and) social capital as a result of inter-firm mobility. Like previous research (e.g., Phillips 2002, Rao and Drazin 2002) we did not directly measure routines. However, unlike this research we tried to tease apart the effect of routines' replication from the potentially confounding consequences of losing social capital by creating the variable *Social Capital Loss*, which measures the change in the stock in province-specific years of experience due to inter-firm mobility. While this variable may also account for human capital features, we rely on our robustness checks – see model section on the individual level analyses – to rule out the existence of selectivity on exiting partners' human and social capital. We ruled out the impact of any “Diaspora effect” by adding a control that adjusts for the percentage of partners leaving in a specific year relative to the total number of partners at the company level the year before the inter-firm mobility event (*Percentage-of-partners-exiting*). Additionally, instead of measuring the ratio of partners to associates, we followed Phillips (2002) by taking the (logged) number of associates, while controlling for the (logged) number of partners. A dummy variable was also coded as 1 to indicate a very *Small firm* – i.e., size of 2 – more fragile and exposed to a higher risk of failure. We also controlled for the number of years elapsed since the founding of an organization by creating the variable *Age*. Following Petersen (1991), we coded the variable by taking the midpoint of each period.

Historical controls. The history of the Dutch accounting industry has been marked by important historical events that might well account for organization dissolution in specific years. Several controls were added. We created two dummies for the governmental regulations dealing with *World War I* conditions (1 if during 1914–1918, 0 otherwise) and the occurrence of *World War II* (1 if during 1941–1946, 0 otherwise). Another institutional event was the emergence of a *Single Association* (or NivRA), which represented the collective interests of all Dutch accounting organizations and was

established in 1966 (1 if year > 1966, 0 otherwise). Besides establishing disciplinary rules, the organization granted the Registered Accountant (RA) license on condition that a prospective auditor acquired “knowledge of complicated audit techniques (such as statistical sampling, risk analysis and analytical review) and extensive knowledge of financial accounting (measurement methods, regulations and standards)” (Maijoor and van Witteloostuijn 1996: 555). The effect of regulatory changes enforced in 1971 and 1984 that significantly heightened the demand for audit services was captured by two dummy variables, *Regulation of 1971* (1 if year > 1971) and *Regulation of 1984* (1 if year > 1984). We used the rate of unemployment (*Unemployment*), a time-varying variable measured at the national level, to control for some of the circumstances under which the migration of professional accountants is more/less frequently observed.

Provincial controls. We tried to estimate the extent to which more general ecological phenomena affect the risk of organizational dissolution with the inclusion of the linear and quadratic effects of density measures at the provincial level: *Province Density* and *Province Density²* (i.e., density squared). To control for the impact that the number of organizations populating the industry has on organization dissolution we also included *C4*, a measure of the level of concentration of the industry given by the total market share of the top four firms. The risk of dissolution might also be influenced by how many firms were created or disappeared each year, which reflects not only the degree of munificence of the environment, but also the extent to which ecological conditions affect inter-organizational mobility by creating/destroying new job opportunities. Thus, we included two variables, *Birth Province* and *Death Province*, to control for the number of firms founded and dissolved during the previous year within a given province. We also included the variable *Province Density at Founding* to account for any imprinting effect. Finally, to capture variations in carrying capacity (number of potential clients) over time, we controlled for *Provincial Inhabitants*, the number of inhabitants in each province for each year. Tables 1 and 2 report the descriptive statistics and the correlation values for the variables we used in the analysis.

4. MODEL AND METHODS

In creating the dataset, we treated the year in which the organization appeared for the first time on the Register of Accountants as the founding year and the last year of appearance as the year of dissolution. We divided the life of each organization in organization-years (Tuma and Hannan 1984). After excluding single proprietorships, the final dataset includes the life of 676 firms divided into 5,404 year-segments, for a total of 518 exit events.

For the analysis we used event history techniques. The coarse data points suggest the adoption of a discrete-time formulation. We model the rate at which failure events occur at a particular time t , conditional upon the values of the observed covariates and upon the event not having occurred prior to time t . This rate, $r[t|X(t)]$, is generally known as the hazard rate. It is formally defined as

$$P_{it} = \Pr(T_i = t \mid T_i \geq t, X_{it}),$$

where T is the discrete random variable measuring the uncensored date of survival and P_{it} is the probability that firm i at time t will still be in existence, given that it did not fail in any previous time interval. A further complication in using this procedure is due to the presence of crude observation points. The data structure challenges the use of a logit model. As Yamaguchi (1991) noted, logit model approaches can be interpreted as a ratio of two odds and such a ratio approaches the ratio of two rates only if the interval between observations is sufficiently small. A valid alternative is a continuous-time data specification which can be used to derive a model for data grouped into intervals (Allison 1995). A complementary log-log specification accomplishes this goal. Under the assumption that events are generated by Cox's proportional hazard rate model, we have

$$\log[-\log(1 - P_{it})] = \alpha_t + \boldsymbol{\delta}' \mathbf{x}_{it},$$

where α_t is an unspecified function of time, \mathbf{x}_{it} is the vector that includes all covariates and controls, and $\boldsymbol{\delta}$ is the vector of coefficients. The model resembles a piecewise specification with the difference

that the hazard of failure is not forced to remain constant across intervals, but is allowed to fluctuate in various ways so long as the assumption of proportionality within each of them is satisfied. Following Pennings and his colleagues (1998), we set those intervals equal to the time gaps in our data and controlled for firm age – i.e., a curvilinear effect of duration.

Further potential problems in our analysis concern the direction of causality and endogeneity. Inter-firm mobility might be an effect rather than a cause of organizational dissolution; individuals are more likely to quit when their firm is performing poorly and “death is sneaking around the corner” (see Wagner 1999). We addressed this concern in different ways. First, we lagged the variables by one period. Since in our data a “period” ranges from a one- to a five-year interval, for 84% of the firms in our database a one-period lag corresponds to 1 to 2 years and for 16% to 3 to 5 years. But endogeneity may be due to systematic differences across exiting individuals. High profile partners (i.e., with high quality human capital), for instance, are more likely to leave the company to join an incumbent or to found their own venture. In a similar vein, the inclination to remain in the same area may also be higher for individuals with a high stock of human and social capital. This potential scenario renders endogenous any donation to organizations located in similar geographical areas, potentially biasing the estimates of the estimated coefficients.

We then double-checked the robustness of our findings in several ways. The spurious effect of poor performance on inter-firm mobility might be ruled out by controlling for a lagged accounting measure of performance. Since we could not obtain accounting data on firm performance (e.g., financial data), we opted for a different solution. Because size growth represents an often-used proxy for organizational success (for example, see Sorensen 1999), the lagged rate of *Size Growth* can be construed as lagged performance, under the assumption that firms expand their ranks when they perform well. Size is easily observed by the firm’s membership, and growth in membership suggests success and long-term viability. If performance is what motivates members to stay or quit, the harmful effects of turnover should be weaker in well performing organizations. We examined this possibility by creating an interaction term between size growth and our most relevant measures of inter-firm mobility – i.e., group average experience transferred to newly founded firms within the same province. The results of this robustness check are reported in the last column of Table 3.

Second, we checked the existence of any underlying correlation between the partners' human/social capital and geographical destination by running a set of analyses at the individual level. More specifically, we reconstructed the history of all the accountants in our database and measured the probability of remaining within the same province against that of moving to a different province upon the realization of an inter-firm mobility event. After excluding the single proprietorships and all the non-mobility events (i.e., other than inter-firm mobility cases such as death and retirement) we ended up with a sample of 867 cases of partner mobility, 62% of which involving movements within the same province and 38% across provinces. We proxied the quality of the human capital involved in the transfer by measuring the relative time-to-promotion of each partner – i.e., the number of years needed to complete the tournament, namely to move from associate to partner (for a discussion of the relevance of this measure see Maister 1993). The results (obtained with a complementary log-log specification, coding 1 the event of remaining within the same province, and 0 all the shifts to a different province) reassured us that human capital randomly distributes across geographical space upon an inter-firm mobility event: the estimates of the coefficients associated with human and social capital (proxied by local experience) were positive but far from being statistically significant. Again, the same coefficients turned out to be statistically insignificant when we estimated the impact of social and human capital on the decision to found a new company (65% of the cases) versus joining an incumbent (35%) upon exiting.

We further checked the existence of any systematic difference across firms due to unobserved effects by running a random effects complementary log-log model.¹ Since no evidence of any unobserved effect was found, we present the results adopting a more parsimonious specification. The analyses presented below, however, are controlling for fixed effects at the province level (not reported in Table 3) to account for unobserved systematic geographical differences across provinces. The statistically significant improvement in the fit of the model due to the addition of provincial

¹ A more complex solution to this problem is to create instruments for all the variables of theoretical interest. This procedure entails the estimation of a survival model where the eight inter-firm variables are replaced with the estimated number of events obtained through eight count models – i.e., instrumented variables. As we found no evident sign of endogeneity while running our robustness checks (see Section 5), we decided not to use this technical correction.

fixed effects points to the existence of different selection environments. All the estimates were obtained using STATA 8.

5. RESULTS

Table 3 presents the estimates of the complementary log-log models for organizational dissolution. Model 1 includes all the control variables. In Model 2, we tested Hypothesis 1 by adding our measures of individual and group-related mobility. In Model 3, a measure of the (logged) average time spent together by the groups leaving is used to test Hypothesis 1a. In Model 4, we juxtaposed the average joint experience of group migrations within and across provinces to test Hypothesis 2. To test Hypothesis 3, in Model 5 we looked at the effect of average joint experience of groups moving to newly founded firms and incumbents (located both inside and outside the focal province). In Model 6 we tested the remaining hypothesis, Hypothesis 4, by considering the three dimensions simultaneously. Model 7 reports the coefficient estimates after we included the interaction term between the size growth variable and the measure of firm exit which is central to our theoretical reasoning.

The baseline model (Model 1) with all the control variables shows that the creation of the single association in 1966 (NivRA) significantly increased the risk of dissolution. By contrast, the increase in demand for auditing services following the introduction of the 1971 regulation reduced the dissolution risk, especially during the years 1971 to 1984. The pattern of the *Age* variable suggests the existence of a curvilinear effect. The coefficients measuring the impact of ecological dynamics on failure rates—*Birth Province*, *Death Province*, *Provincial Density at Founding*, *Provincial Density* and *Provincial Density2*—are all in the expected direction and statistically significant. These results confirm that the survival chances of the focal firm are mainly dependent on the evolutionary dynamics of local populations.² Although the coefficient estimating the effect of exits that do not involve inter-firm mobility is positive, it does not reach statistical significance. On the contrary, the coefficient estimate of the variable measuring the impact of losing social capital is positive and statistically significant.

² Analyses not reported here demonstrate that the local ecological effects dominate over national effects.

Model 2 presents the estimates measuring the competitive effects of inter-firm mobility after we distinguished between individual vs. group movements. The risk of organizational dissolution is statistically significant when inter-firm mobility involves a group of partners rather than single individuals. Model 3 refines this finding by replacing the group dummy with a measure of average joint experience of departing members. The positive and statistically significant estimate of the variable *Group-avg-joint-exp-to-any* provides support to our Hypothesis 1a. We then disaggregated this measure according to the nature of the destination firm (incumbent or newly founded) and to its geographical location (within the same province or a different one). Model 4 compares the findings depending on whether the recipient firm is an incumbent or an entrepreneurial firm. Only the coefficient for newly founded organizations is statistically significant, so confirming Hypothesis 2. Model 5 reports the estimates across geographical space. The estimates seem to confirm Hypothesis 3: the coefficient of the variable capturing movements within the same province is the only one statistically significant.

In the previous models the three dimensions (individual vs. group; incumbent vs. start-up; same vs. different geographical context) were treated as independent. Thus, they do not inform us about how those dimensions jointly affect organizational survival. Model 6 is meant to aggregate these three dimensions. The coefficient estimates reported in Model 6 suggest a few considerations. First, the effect of migration as a group is stronger than that of individual movement. Second, the strongest effects of inter-firm mobility on dissolution are related to movements within the same geographical area. Third, for each case the risk of organizational dissolution is much higher when partners leave the focal organization to found a new rival rather than join an existing rival. In line with Hypothesis 4, the hazard of dissolution is the highest when groups depart to found a new firm located in the same province as the source firm.

Model 7 further corroborates these findings by combining *Size Growth* (lagged)—a proxy for good performance—with the *Group-avg-joint-exp-to-new-diff-pr* variable presented in Model 6. Since this interaction term turned out to be non-significant, we interpreted this result as an indication that the competitive impact of routines replication is independent of the donor's firm health.

6. DISCUSSION AND CONCLUSIONS

The analysis of the effects of member exit on organizational survival has spun research on the antecedents and the consequences of this event. The present study pushes this inquiry by investigating the effects of specific turnover scenarios on firm survival. We limited our theorizing to those exit cases in which a member departs to a peer firm, while controlling for other scenarios representing complete departure from the sector. Being a study of partnerships, we focused on partners, i.e., key members who participate in the governance of their firm. Their exit was framed in terms of higher order routines replication.

Recent research has begun to investigate how such mobility affects the performance of the source firm (Sørensen 1999), the destination firm (Agarwal et al. 2004, Rao and Drazin 2002), or both simultaneously (Phillips 2002), under the assumption that inter-firm mobility entails the transfer of routines but without further qualifying the conditions facilitating their replication. We contribute to this body of research in three ways. First, special attention is drawn to the scenario where inter-firm mobility translates into the transfer of higher-order routines across organizations, such that the different effect of individual versus collective migrations is exposed. Second, this paper demonstrates how migrations to incumbents are less likely to affect the long-term performance of the donor than are migrations to newly founded firms. Third, this study shows the relevance of the same historical, socio-economic and institutional environment in facilitating successful replication of existing routines (see Stinchcombe, 1965 and for a comprehensive review of this article, Lounsbury and Ventresca, 2002) and therefore increasing the competitive effects of inter-firm mobility. Altogether, this paper builds on the insights of research on spin-offs behavior and survival (Agarwal et al., 2004; Phillips, 2002; Ruef, 2005; Burton et al., 2002; Klepper and Sleeper, 2005) to uncovers conditions under which the spill-over of proprietary routines exposes the source firm to unfavorable survival prospects. The loss of proprietary organizational routines occurs most ominously when senior members depart collectively, and especially so when they have spent many years together before leaving.

This paper is concerned with the competitive consequences occasioned by routine replication due to outbound movements, while controlling for loss of human and social capital.

Unlike previous research that does not distinguish between resources and routines, we believe such a distinction to be important both theoretically and empirically. The thrust of the argument is that resources such as social capital are usually attached to individuals and therefore more likely to be transferred as those individuals move from firm to firm. By contrast, routines are not bound to single individuals: since they originate from repeated interaction among multiple actors inside and/or outside the firm, their successful replication is a more complex and uncertain phenomenon necessitating a much broader set of conditions to hold. Even though routines are unobserved and this paper — like the kindred papers of Phillips (2002) and Klepper and Sleeper (2005) and others — does not measure replication as such, we attempted to measure the impact thereof, net of the effect of losing human/social capital. Needless to say, further empirical research, using more fine-grained data, is needed to validate our claims.

It should be noted that the replication of proprietary routines under investigation in this paper is typically not premeditated, even if “poaching” is usually driven by competitive motives. Spin-offs are frequently due to in-adverted turnover of employees who seek an organizational setting outside the parent firm. The presumption is that voluntary (as in the case of partners) produces consequences quite different from those turnover events brought about by “human resources” strategies. For example, many firms maintain elaborate job rotation systems as one of the means of deliberate routine transfer. As for such transfers, consider that many firms — e.g., Home Depot, Kinko’s, Toyota, Carrefour — base their strategic intentions on routine replication, usually well-articulated and explicit organizational routines (see Winter and Szulanski 2001). Intentional transfer occurs also between firms through strategic alliances, outsourcing, guest engineers and so on. We believe that our study is among the first to belabor theoretically how such non-premeditated events involving key players reveal competitive externalities.

In its present form, the study suffers from several limitations. Each limitation, however, can be associated with a specific direction for future research. The contextually dependent replication of routines involves knowledge intensive firms. Similar mobility consequences can be observed in high-tech industries (e.g., software, biotech, semiconductors—compare Klepper and Sleeper 2005) where spin-offs occasion spatial replication of routines. Further research should spell out the mobility

implications for manufacturing versus service firms. Partnerships differ from incorporated firms with various levels of limited liability and family-owned or single proprietorships (which we omitted from the present analysis). How do such varying classes of organizations and their legal or institutional traditions affect the absorption of new higher-order routines? Apart from variations among sectors, within sector heterogeneity among firms differently exposed to the routine replication risk was observed as well. The present paper does not address this question and treats organizations in a dichotomous way: a newly founded firm or an incumbent. This distinction is premised on the idea that incumbents already are saddled with legacies of routines, i.e., endowed with institutionalized patterns of interaction, chafing with those having an extramural provenance. Accordingly, in the analysis we compared these two classes of firms as a dichotomy. Yet existing firms differ along several dimensions that shape their susceptibility to absorption of extramural routines. Accounting for those dimensions amounts to an important refinement and further elaborates on the conduciveness of routine replication across firms. Consider dimensions such as firm age or size, aspects of organizational demography such as diversity in experience or skill sets and firm performance prior to outbound movements. Such inquiries push the frontiers of knowledge regarding migration of firm proprietary routines and related spill-overs to new levels but are beyond the scope of this study.

The finding that the effects of inter-firm mobility are very much regional hints at geographic niches harbouring organizational routines. The exit of professionals often precipitates jolts, upheavals and other forms of organizational change and discontinuity. We argued that the equivalence of geographic embeddedness for mobility-based replication is critical, and that one should spell out the nature of location equivalence. We have shown that the effects of mobility and routine replication are most observable if they occur within the same environment—i.e., when donor and destination firms are co-located. Historical, socio-economic and institutional differences in the location of the donor and the destination firms matter more than geographical distance per se. Additional specification of the nature of geographic units such as SMSAs and industrial districts should improve the explanatory power of geography and co-location.

Finally, access to individual motivation and cognition for inter-firm mobility remains elusive. While the present paper strongly hints at the incompleteness of perspectives like that of Galanter and Palay (1991), i.e., firms are exclusive arenas for tournament-based careers, by explicitly extending the inquiry of mobility into their external environment we have greatly enhanced the insights regarding careers across firms. Yet we have been agnostic about motives that induce individual or collective career related action. We exposed effects of individual conduct shaping firm and sector level externalities, even if we did not find any evidence of selectivity among events involving individuals endowed with significant human or social capital (fast-trackers or partners ranking high in their level of industry experience). Yet the motives of individuals to leave and thus to significantly affect local competition suggest to draw the individual level of analysis more centrally into an inquiry of inter-firm competition. Additional multi-level information about this issue might thus contribute to a more comprehensive understanding of the implications of inter-firm mobility, routines replication and organizational survival.

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Table 1
Descriptive Statistics

Variables	N Obs.	Mean	Std Dev	Min	Max
Age	5404	14.667	13.626	0.50	66.00
World War I	5404	0.028	0.165	0.00	1.00
World War II	5404	0.080	0.272	0.00	1.00
Single Association	5404	0.264	0.441	0.00	1.00
Regulation 1971	5404	0.199	0.399	0.00	1.00
Regulation 1984	5404	0.123	0.329	0.00	1.00
Province Inhabitants	5404	1810008	652859	271669	3121471
C4	5404	0.239	0.121	0.11	1.00
Birth Province	5404	14.383	11.967	0.00	65.00
Death Province	5404	14.126	12.928	0.00	57.00
Provincial Density at Founding	5404	57.356	37.076	0.00	126.00
Provincial Density	5404	70.496	37.067	0.00	126.00
Provincial Density Squared	5404	6343.395	4781.663	0.00	15876.00
Unemployment	5404	7.399	8.006	0.10	32.70
Small Firm	5404	0.409	0.492	0.00	1.00
# Partners (log)	5404	1.098	0.853	0.00	5.07
# Associates (log)	5404	0.539	1.706	0.00	5.34
Other-Than-Inter-firm-Exits (log)	5404	0.409	1.717	0.00	12.06
Social Capital Loss	5404	0.077	0.438	0.00	10.00
Percentage-partners-leaving	5404	0.047	0.243	0.00	9.00
Group-exit-dummy	5404	0.079	0.270	0.00	1.00
Individual-exit-dummy	5404	0.157	0.364	0.00	1.00
Group-avg-joint-exp-to-any (log)	5404	0.938	0.357	0.00	2.80
Group-avg-joint-exp-to-new (log)	5404	0.971	0.315	0.00	0.74
Group-avg-joint-exp-to-inc (log)	5404	0.929	0.440	0.00	1.25
Group-avg-joint-exp-to-same-pr (log)	5404	0.985	0.910	0.00	4.67
Group-avg-joint-exp-to-diff-pr (log)	5404	0.944	0.402	0.00	3.74
Group-avg-joint-exp-to-inc-same-pr (log)	5404	0.984	0.179	0.00	1.79
Group-avg-joint-exp-to-new-same-pr (log)	5404	0.987	0.183	0.00	2.74
Group-avg-joint-exp-to-inc-diff-pr (log)	5404	0.973	0.222	0.00	2.43
Group-avg-joint-exp-to-new-diff-pr (log)	5404	0.993	0.125	0.00	2.56

Table 2
Pairwise correlations

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31							
Age	1.00																																					
World War I	-0.06	1.00																																				
World War II	0.20	-0.05	1.00																																			
Single Association	-0.28	-0.10	-0.18	1.00																																		
Regulation 1971	-0.24	-0.08	-0.15	0.83	1.00																																	
Regulation 1984	-0.18	-0.06	-0.11	0.63	0.75	1.00																																
Province Inhabitants	-0.02	-0.15	-0.03	0.27	0.23	0.17	1.00																															
C4	-0.26	-0.08	-0.19	0.85	0.85	0.63	0.22	1.00																														
Birth Province	0.04	-0.06	0.10	0.17	0.10	0.17	0.35	0.08	1.00																													
Death Province	0.00	-0.13	-0.08	0.18	0.19	0.21	0.48	0.18	0.45	1.00																												
Provincial Density at Founding	-0.26	-0.13	0.00	-0.07	-0.10	-0.12	0.62	-0.12	0.29	0.41	1.00																											
Provincial Density	0.21	-0.11	0.09	-0.41	-0.38	-0.31	0.50	-0.44	0.20	0.35	0.69	1.00																										
Provincial Density Squared	0.23	-0.14	0.06	-0.47	-0.42	-0.34	0.40	-0.48	0.09	0.29	0.64	0.97	1.00																									
Unemployment	0.06	0.02	0.17	-0.14	-0.04	0.07	-0.17	-0.20	0.15	0.08	-0.09	0.12	0.12	1.00																								
Small Firm	-0.08	0.09	-0.01	-0.11	-0.10	-0.10	-0.07	-0.10	-0.06	-0.06	0.02	-0.02	-0.02	0.05	1.00																							
# Partners (log)	0.10	-0.02	-0.03	0.17	0.16	0.14	0.09	0.17	0.14	0.14	0.01	0.02	-0.01	-0.02	-0.56	1.00																						
# Associates (log)	0.11	-0.11	0.02	0.12	0.13	0.13	0.21	0.12	0.08	0.15	0.11	0.10	0.10	-0.13	-0.47	0.49	1.00																					
Other-Than-Inter-firm-Exits	0.07	0.01	-0.04	0.02	0.01	-0.01	0.00	0.02	-0.01	0.07	0.04	0.05	0.05	-0.02	-0.19	0.39	0.21	1.00																				
Social Capital Loss	0.09	-0.02	-0.03	0.03	0.05	0.05	0.01	0.04	0.06	0.03	0.00	0.00	0.00	-0.04	-0.10	0.22	0.18	0.38	1.00																			
Percentage-partners-leaving	0.10	0.01	-0.02	-0.03	-0.02	-0.02	-0.02	-0.02	-0.05	-0.03	-0.03	0.01	0.02	-0.06	0.00	-0.01	0.01	0.08	0.06	1.00																		
Group-exit-dummy	-0.02	-0.05	-0.07	0.17	0.11	0.05	0.10	0.15	0.01	0.11	0.04	-0.03	-0.03	-0.14	-0.15	0.20	0.09	0.26	0.15	0.06	1.00																	
Individual-exit-dummy	0.05	0.06	0.02	-0.14	-0.12	-0.10	-0.11	-0.15	-0.04	-0.02	-0.02	0.05	0.05	0.09	-0.03	0.08	-0.04	0.52	0.25	0.09	0.06	1.00																
Group-avg-joint-exp-to-any	0.01	-0.02	-0.04	0.12	0.13	0.13	0.05	0.12	0.02	0.05	0.01	-0.03	-0.04	-0.05	-0.10	0.17	0.11	0.20	0.25	0.05	0.32	0.07	1.00															
Group-avg-joint-exp-to-new	0.00	0.00	-0.03	0.11	0.09	0.11	0.04	0.10	0.03	0.02	0.00	-0.03	-0.04	-0.01	-0.05	0.13	0.09	0.17	0.24	0.04	0.14	0.07	0.61	1.00														
Group-avg-joint-exp-to-inc	0.02	-0.03	-0.04	0.08	0.10	0.07	0.04	0.09	-0.01	0.05	0.01	-0.02	-0.02	-0.07	-0.10	0.13	0.07	0.15	0.15	0.04	0.33	0.04	0.80	0.04	1.00													
Group-avg-joint-exp-to-same-pr	-0.01	0.01	-0.03	0.10	0.10	0.12	0.02	0.09	0.03	0.02	-0.01	-0.03	-0.04	0.00	-0.05	0.10	0.08	0.13	0.22	0.02	0.13	0.07	0.58	0.80	0.12	1.00												
Group-avg-joint-exp-to-diff-pr	0.05	-0.02	-0.03	0.06	0.05	0.02	0.04	0.06	-0.01	0.03	0.01	-0.02	-0.01	-0.07	-0.09	0.15	0.08	0.20	0.17	0.05	0.31	0.04	0.70	0.32	0.70	0.02	1.00											
Group-avg-joint-exp-to-inc-same-pr	-0.04	-0.02	-0.03	0.09	0.11	0.12	0.04	0.09	0.02	0.05	0.01	-0.02	-0.02	-0.02	-0.05	0.06	0.03	0.04	0.08	0.01	0.14	0.01	0.49	-0.01	0.61	0.16	0.00	1.00										
Group-avg-joint-exp-to-new-same-pr	0.01	0.01	-0.02	0.08	0.08	0.10	0.01	0.07	0.03	0.01	-0.01	-0.03	-0.04	0.01	-0.04	0.09	0.08	0.12	0.21	0.02	0.10	0.07	0.51	0.80	0.01	0.98	0.02	-0.01	1.00									
Group-avg-joint-exp-to-inc-diff-pr	0.06	-0.02	-0.02	0.03	0.03	0.01	0.02	0.03	-0.01	0.03	0.01	-0.01	0.00	-0.07	-0.08	0.11	0.07	0.15	0.13	0.03	0.28	0.04	0.64	0.05	0.78	0.02	0.88	0.00	0.02	1.00								
Group-avg-joint-exp-to-new-diff-pr	-0.01	-0.01	-0.02	0.07	0.05	0.04	0.04	0.07	0.00	0.02	0.02	-0.02	-0.02	-0.02	-0.04	0.09	0.05	0.12	0.13	0.04	0.09	0.02	0.35	0.58	0.05	0.01	0.51	-0.01	0.00	0.07	1.00							

Table 3 - Complementary Log-Log Models for the Dissolution Rate of Dutch Accounting Firms 1880–1986
 (provincial fixed effects included— 518 events); ** $p < 0.05$; * $p < 0.10$. Two tails tests

Variables	Model 1	Std. Err.	Model 2	Std. Err.	Model 3	Std. Err.	Model 4	Std. Err.	Model 5	Std. Err.	Model 6	Std. Err.	Model 7	Std. Err.
Time gap 2 years	1.510	0.095 **	1.275	0.114 **	1.501	0.095 **	1.503	0.096 **	1.509	0.095 **	1.502	0.096 **	1.513	0.096 **
Time gap 3 years	-2.134	1.006 **	-1.952	1.019 *	-2.125	1.006 **	-2.123	1.006 **	-2.128	1.006 **	-2.126	1.006 **	-2.121	1.006 **
Time gap 4 years	3.422	0.182 **	3.002	0.210 **	3.382	0.183 **	3.386	0.182 **	3.406	0.183 **	3.369	0.184 **	3.386	0.185 **
Time gap 5 years	2.652	0.559 **	2.515	0.535 **	2.604	0.561 **	2.618	0.560 **	2.641	0.559 **	2.617	0.560 **	2.634	0.560 **
Age	-0.087	0.012 **	-0.091	0.013 **	-0.088	0.012 **	-0.088	0.012 **	-0.088	0.012 **	-0.089	0.012 **	-0.089	0.012 **
Age 2	0.002	0.0002 **	0.002	0.0002 **	0.002	0.0002 **	0.002	0.0002 **	0.002	0.0002 **	0.002	0.0002 **	0.002	0.0002 **
World War I	-0.078	0.607	0.051	0.618	-0.074	0.608	-0.073	0.608	-0.075	0.608	-0.073	0.608	-0.091	0.608
World War II	-0.536	0.398	-0.362	0.389	-0.498	0.398	-0.500	0.398	-0.517	0.398	-0.492	0.398	-0.517	0.402
Single Association	1.195	0.280 **	1.174	0.316 **	1.190	0.278 **	1.185	0.277 **	1.187	0.279 **	1.179	0.276 **	1.165	0.277 **
Regulation 1971	-0.016	0.281	0.118	0.258	-0.009	0.280	-0.001	0.280	-0.001	0.281	0.008	0.282	0.045	0.284
Regulation 1984	-1.680	0.222 **	-1.450	0.237 **	-1.694	0.222 **	-1.690	0.222 **	-1.693	0.222 **	-1.705	0.223 **	-1.713	0.223 **
Province Inhabitants (in millions)	0.02	0.03	0.02	0.03	0.02	0.03	0.02	0.03	0.02	0.03	0.02	0.03	0.02	0.03
C4	1.151	1.141	0.590	1.124	1.105	1.131	1.081	1.135	1.098	1.140	1.082	1.136	0.994	1.141
Birth Province	-0.021	0.007 **	-0.025	0.007 **	-0.021	0.007 **	-0.021	0.007 **	-0.021	0.007 **	-0.021	0.007 **	-0.020	0.007 **
Death Province	0.059	0.006 **	0.058	0.006 **	0.059	0.006 **	0.059	0.006 **	0.059	0.006 **	0.059	0.006 **	0.059	0.006 **
Provincial Density at Founding	0.006	0.003 **	0.007	0.003 **	0.006	0.003 **	0.006	0.003 **	0.006	0.003 **	0.006	0.003 **	0.006	0.003 **
Provincial Density	-0.030	0.014 **	-0.024	0.015	-0.027	0.014 *	-0.017	0.014	-0.026	0.014 *	-0.027	0.014 *	-0.026	0.014 *
Provincial Density Squared	0.0002	0.0001 **	0.0002	0.0001 **	0.0002	0.0001 **	0.0002	0.0001 **	0.0002	0.0001 **	0.0002	0.0001 **	0.0002	0.0001 **
Unemployment	-0.063	0.017 **	-0.039	0.016 **	-0.063	0.017 **	-0.063	0.017 **	-0.063	0.017 **	-0.063	0.017 **	-0.063	0.017 **
Small Firm	0.047	0.115	0.528	0.128 **	0.057	0.115	0.054	0.115	0.045	0.115	0.060	0.115	0.109	0.118
# Partners (log)	-0.007	0.075	-0.335	0.083 **	-0.028	0.076	-0.028	0.076	-0.017	0.077	-0.024	0.075	0.048	0.080
# Associates (log)	-0.067	0.034 *	0.070	0.039 *	-0.066	0.034 *	-0.067	0.034 *	-0.069	0.034 **	-0.066	0.034 *	-0.038	0.035 **
Other-Than-Inter-firm-Exits	0.011	0.026	-0.094	0.031 **	0.008	0.027	0.007	0.027	0.008	0.027	0.011	0.027	0.004	0.028
Social Capital Loss	0.157	0.065 **	0.116	0.069 *	0.115	0.063 *	0.112	0.064 *	0.126	0.062 **	0.117	0.063 *	0.073	0.077
Percentage-partners-leaving	0.252	0.102 **	0.213	0.128 *	0.256	0.102 **	0.256	0.102 **	0.254	0.102 **	0.255	0.102 **	0.287	0.101 **
Group-exit-dummy			2.628	0.135 **										
Individual-exit-dummy			0.070	0.145										
Group-avg-joint-exp-to-any					0.215	0.079 **								
Group-avg-joint-exp-to-new							0.167	0.081 **						
Group-avg-joint-exp-to-inc							0.107	0.074						
Group-avg-joint-exp-to-same-pr									0.036	0.017 **				
Group-avg-joint-exp-to-diff-pr									0.019	0.072				
Group-avg-joint-exp-to-inc-same-pr											0.203	0.165	0.241	0.164
Group-avg-joint-exp-to-new-same-pr											0.455	0.113 **	0.383	0.115 **
Group-avg-joint-exp-to-inc-diff-pr											0.032	0.151	0.026	0.149
Group-avg-joint-exp-to-new-diff-pr											0.245	0.153	0.239	0.152
Size Growth													-0.032	0.013 **
Size Growth*Group-avg-exp-to-new-same-pr													0.006	0.008
Constant	-2.535	0.497 **	-2.595	0.510 **	-2.288	0.501 **	-1.316	0.683 **	-2.214	0.584 **	-1.583	0.600 **	-1.592	0.594 **
Log Likelihood	-1257.62		-1254.78		-1254.54		-1254.53		-1255.18		-1251.99		-1247.19	