

Organizational Turnover and the Evolution of Localized Populations

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ABSTRACT

This paper studies the effect of organizational turnover on firm survival within the Dutch accounting service industry during the period 1880-1986. We address four issues: (1) estimating the effect of organizational turnover on organizational dissolution; (2) uncovering this effect under variable conditions of firm vitality; (3) showing the significance of propinquity in isolating that effect; and (4) demonstrating this effect to be also a function of member status. The results of our analysis confirm that turnover is an important endogenous force shaping the evolution of localized populations of organizations. Controlling for firm vitality, the risk of organizational dissolution increases when turnover entails losses of valuable human and social capital (e.g., long-term owners) to peer firms. The results also show that such risk is even higher when organizational members join a competitor or found a new venture within the same geographical area. We discuss the implications of this multi-level analysis for exposing market processes or population dynamics. .**

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INTRODUCTION

Turnover has been shown to have important implications for organizational performance. Although some authors (March, 1991; Simon, 1991) have stressed how firms can enhance innovation and creativity by replacing old members with new ones, turnover often triggers internal disruptions that negatively affect organizational performance, for example, by jeopardizing smooth internal functioning (see Baron, Hannan and Burton, 2001; Phillips, 2002). Additionally, turnover might affect performance due to the loss of human capital to rival organizations (Rao and Drazin, 2002).

A good deal of work on organizational turnover has been oriented to teams and firm performance, most commonly top management teams and their CEOs (e.g., Castanias and Helfat, 1991), and to the transferring member's performance (e.g., Harris and Helfat, 1997; Groysberg and Nanda, 2001). There is also a vast body of literature dealing with demographic processes that are triggered by organizational turnover (see Williams and O'Reilly III, 1998). Yet, despite this previous research, the implications of organizational turnover for organizational performance remain poorly understood. The time has now arrived for more fine-grained theory and empirical research on turnover and performance.

To this end, the purpose of this paper is twofold. First, we ask under what firm conditions turnover is most harmful. One firm travels down a road to decline in which case exit of members might expedite its descent. In contrast, another firm enjoys vitality and finds itself in an excellent position to continuously maintain its stock of human capital. Thus, we examine the effect of turnover under variable degrees of firm vitality.

Second, when turnover entails inter-firm mobility between two firms, the donor and recipient firms, the effects of such inter-firm transfer should be explicitly addressed. The effects take on a rather different significance depending on whether the two firms are competitively interdependent, like when they operate within the same geographically proximate environment. Drawing on the recent findings on spatial heterogeneity (e.g., Greve, 2000) we advance this line of inquiry by investigating whether the disruptive effects of organizational turnover are most pronounced under conditions of propinquity.

Such inquiry leads us to explore the link between micro- (i.e., individual) and macro-level (i.e., organization, population) phenomena and illustrate their interaction in shaping the evolution of the industry. We analyze data on the entire population of Dutch accounting firms during the period 1880-1986. The longitudinal character of the study allows tracking such effects as they unfold over time. We also believe the service industry to represent an ideal setting to study the effects of organizational turnover on firm dissolution for at least two reasons. First, the departure of professionals – especially partners (i.e., the owners of the firm) – has important implications for the functioning and often even the survival of an organization. Second, since the relationships between professionals and clients tend to be local, the industry is highly suitable for testing the spatial heterogeneity hypothesis.

THEORY

Our theoretical framework encompasses several levels of analysis, including that of individual, firm and industry. Following Argote and Ophir (2002), we predict that in industries in which knowledge is embedded in individual members – e.g., law and

accountancy firms – “organizations would make considerable effort to retain their members and would perform better when they do” (2002: 197). Yet, since turnover might be an effect rather than a cause of organizational dissolution – individuals are more likely to quit their job when their firm is performing poorly (see Wagner, 1999) – the influence of turnover on performance is mediated by organizational vitality. To untangle the difference between ‘healthy’ and ‘near to death’ organizations, we account for their vitality by tracing the annual net increment in the size of organizational membership. This line of thought accords with theoretical reasoning and some empirical evidence (e.g., Phillips, 2001; Rao and Drazin, 2002).

We also assume that the negative consequences of turnover are related to the loss of human (individual skills and knowledge) and social (most notably, relation with clients) capital to competitors. The effect of this loss is moderated by the status of the defecting organizational members as well as the geographical destination of their movements. Holding firm vitality constant, we argue that the risk associated with turnover is proportional to (i) the loss of human capital, which we relate to the status of the defecting members (e.g., owners or employees); and (ii) the loss of social capital (i.e., network of clients), which we assume to decrease with the geographical scale of the movements of such members. In the next two sections we further elaborate on these points.

The Individual and the Organization

The study of the performance implications of organizational turnover has spun a large body of research that has alternatively adopted a negative versus a positive lens (see Staw, 1980; Pfeffer, 1983; Abelson and Baysinger, 1984; Argote and Ophir, 2002). The tension between

these two perspectives can be dealt with by looking at the competitive characteristics of the industry and at the pros and cons of stable versus fluid memberships. While low turnover levels are conducive to knowledge retention and social cohesion, moderate turnover levels engender knowledge creation and innovation. We start with the premise that, whenever individuals are important repositories of a firm's knowledge, turnover might raise the risk of dissolution (Coff, 1999). In knowledge intensive industries, human resources are among the most critical, if not the most critical, organizational resources (see Penrose, 1959; Reed and DeFilippi, 1990). As Baron, Hannan and Burton have shown in their study of start-ups in Silicon Valley, "employee turnover risks losing the firm's most precious asset, its human capital" (2001: 962). Not surprisingly, it is common in such knowledge intensive industries to acquire new knowledge by 'poaching' skilled individuals from peer firms (Flides, 1990; Baum and Ingram, 1998).

While the arguments revolving around the loss of valuable human capital emphasize the harmful consequences of personnel turnover, a more fine-grained analysis is required to understand why turnover may produce higher rates of organizational dissolution. To this end, we draw from evolutionary economics and social capital theories. Although from different theoretical lenses, these theories share the basic idea that turnover does not merely entail losing valuable human capital, but often affects firm survival.

In the evolutionary economics tradition, Nelson and Winter (1982) have highlighted the potential negative effects of organizational turnover. They maintain that "the memories of individual organization members are a primary repository of the operational knowledge of the organization. Some part of the information thus stored may be readily replaced if the

particular member storing it leaves the organization ... But in some cases the memory of a single organization member may be the sole storage point of knowledge that is both idiosyncratic and of great importance to the organization” (1982: 115). Organizational memory does not coincide with individual memory. Yet, individual memory constitutes the primary organizational repository of operational knowledge, particularly that which resides among long-tenured individuals who are highly instrumental in retrieving knowledge (see Walsh and Ungson, 1991). Turnover should have an even stronger negative impact in knowledge intensive industries, where organizational members are the repositories of tacit knowledge (Polanyi, 1967; Winter, 1987) and the loss of valuable human capital, therefore, is even more paramount.

Turnover also triggers organizational dissolution through the attrition of a firm’s social capital. By social capital we do not simply mean the “supporting relationships with other economic actors, most notably, potential clients” (Pennings, Lee and van Witteloostuijn, 1998: 426), but also the web of internal relationships among individuals (and groups of individuals) within a given organization. This concept pertains to linkages among actors inside and outside the organization, and is consistent with that proposed by Nahapiet and Ghoshal (1998).¹ Organizations endowed with social capital have superior access to valuable resources and are likely to exhibit superior performance (Burt, 1992). Similarly, research on social networks has demonstrated how internal ties significantly improve the outcomes of an organization’s problem-solving activity (Hargadon and Sutton, 1997; Argote, 1999; Hansen, 1999). Just as internal relationships (e.g., among organizational members) provide resources in the form of collectively shared skills and complementary knowledge pools, so do external

relationships. External contacts are among the organization's most valuable resources (Burt, 1992).

In service industries the organizational success hinges on the ability to deliver high-quality services and to attract and retain clients (Pennings, Lee and van Witteloostuijn, 1998). *Ceteris paribus*, new clients will choose a firm on the basis of previous ties with its professionals. Organizations benefit from members endowed with valuable social capital (Coleman, 1988; Uzzi, 1996). Thus, member exit produces loss of social capital as well. By altering webs of social relationships, both internal and external, the migration of individuals has potentially harmful consequences for the firm. The effect of losing access to valuable resources through such individuals' social networks and relations (Lin, Cook and Burt, 2001) is even stronger when human and social capital spills over to peer firms. Although recruits can endow a firm with new social relations, such contacts need to be properly harmonized with pre-existing ones.

In brief, organizational survival hinges on the ability to preserve not only the internal ties through which organizational members share skills and knowledge, but also the external ties that enhance their ability to attract and retain clients (Smigel, 1969; Maister, 1993), because social relationships with clients mediate economic transactions (Granovetter, 1985). Thus, the migration of organizational members raises the risk of firm dissolution through the loss of valuable human and social capital. This leads to the following hypothesis:

Hypothesis 1: Organizational turnover increases the chance of organizational dissolution.

The impact of turnover on organizational dissolution is particularly severe when organizations lose more employees than they gain. The departure of organizational members can precipitate organizational decline, although in this case it is the effect rather than the ultimate cause of the whole process. By contrast, the ability to replace human capital as old capital leaves the firm – whether voluntarily or involuntarily – is an important indicator of organizational vitality. By replenishing its stock of human capital, an organization can attenuate if not reverse the harmful effects of turnover. Although even poorly performing organizations often succeed in attracting new individuals with expectations of higher odds of promotion (Phillips, 2001), firms that occupy strong competitive positions are more likely to attract new individuals and display a net growth over time. Furthermore, the latter firms can afford to retain individuals with greater growth potential and discharge substandard ones.

Vital firms stand a greater chance to offset the effects of turnover. They also treat turnover as a means to upgrade their stock of intangible assets. March (1991), for example, argues that a moderate level of turnover and the replacement of departing members with new recruits engender further exploration. Bringing in individuals not yet socialized into the organizational norms and values fosters exploratory search and eventually creation of new knowledge. Although the flip side of turnover is to increase the training (or socialization) costs of newcomers – which can even become a barrier to innovation (Simon, 1991) – the introduction of less socialized people into an existing organization “increases exploration, and thereby improves aggregate knowledge” (March, 1991: 79). By fostering exploratory search, turnover compensates for the adverse implications of organizational learning. Since learning enhances an organization’s competitive advantage by improving its average performance, the tendency to repeat successful behaviors and discourage any deviations

from them undermines the ability to succeed in the future. Such firms are likely to fall into competency traps (Levinthal and March, 1993).

Professional service firms invest heavily in the recruitment and socialization of new members, and require a tournament that often takes more than a decade to complete (see Smigel, 1969; Maister, 1993). The tournament towards partnership assures a smooth and ongoing addition of new human and social capital. In this sense, the ability to hire and retain professionals may signal a sustainable competitive advantage relative to peer firms. The study of Silicon Valley firms by Puranam (2001) shows that the success of acquisitive behavior by competing firms hinges not so much on the net addition of employees and the firms that employed them, as on their ability to successfully ‘graft’ or integrate new employees into the core of the firm. Of course, partnerships that embody elaborate socialization arrangements have institutionalized such grafting through a tournament system. Presumably, they differ in their ability to attract, integrate, retain or purge their membership ranks. Conversely, failure to attract and retain certain members reveals “low levels of social integration or attachment to fellow group members” (Sørensen, 2000: 4). Therefore, if firms succeed in preserving or expanding their stock of human capital, we would surmise them to maintain a high level of vitality. By contrast, the harmful effects of turnover are strong for those firms that cannot meet the challenge of retaining and expanding valuable human capital and, thus, display diminished vitality. We then hypothesize:

Hypothesis 1a: Organizational vitality mediates the negative consequences of turnover for organizational survival.

The Organization and the Environment

Although different types of turnover can be observed – organizational members can become unemployed, retire or find employment in other industries – in evolutionary terms its implications are most interesting when such members join a competitor or found a new venture within the same industry. Organizational turnover represents one of the avenues through which skills and knowledge become transferred spatially. Similarly, not only do individuals migrate from organization to organization, but also pre-existing relationships with clients often follow similar migratory patterns – especially if within the same local market.

The study of the relation between organizational dynamics and geography has a long tradition that traces back to research on human ecology. Human ecologists were among the first to argue that network ties emerge among actors who are spatially co-located (Park, 1926; Hawley, 1950), because the costs of social interaction increase with geographical distance (Lazersfeld and Merton, 1954). Since human activities assume an orderly arrangement in space, the latter ultimately leads to the formation of ‘human ecologies’ whose boundaries are spatially or geographically delimited. Although these boundaries may evolve – and even disappear – over time, the ‘geography’ of localized populations generally comprises a patchwork of locally differentiated areas (McKenzie, 1968).

Drawing from this strand of research, we argue that spatial considerations significantly account for the differential impact of organizational turnover among geographically dispersed populations of organizations. The loss of valuable human and social capital to a competitor or newly started venture is more strongly felt within the same geographical area.

More distant firms are less likely to compete for the same pool of resources or to interact with one another. The intensity of the interaction among organizations is proportional to their degree of physical proximity (e.g., Baum and Mezias, 1992). In professional services sectors, with a preponderance of personal (i.e., based on trust and reputation) and local (i.e., embedded in the existing social fabric) relationships, the survival of an organization is primarily – though not exclusively – geared to garnering locally available resources. Firms acquire and retain such resources by offering customized services and adapting their practice to the special needs of local clients (Smigel, 1969; Porter, 1980; Maister, 1993). Over time organizational members can even become confidants of clients and strong personal ties often ensue. When organizational members migrate within the same geographical area, defecting clients face lower switching costs: they can readily move with the departing professional. The firm, therefore, ends up losing valuable human (e.g., individual skills and knowledge) and social (e.g., relations with clients) capital to a peer or newly founded firm, both competing for the same scarce resources (e.g., talented professionals and clients). By contrast, a firm's jeopardy is diminished when its members migrate beyond the confines of a given geographical area. We then hypothesize:

Hypothesis 2: The impact of organizational turnover on organizational dissolution is stronger when the migration of individuals occurs within the same geographical area.

It matters a great deal *who* turns over! Some departing members are undoubtedly of inferior importance (with respect to the possession of expertise, contacts, etc.). Professional service firms have a dual stratification in which partners are usually endowed with superior quality – if only because they have been around longer and have successfully completed the

tournament from associates to partnership. The employees remain still untested although most departing associates can be presumed to exit because they have not passed the ongoing screening test, which constitutes an integral part of the tournament.

The turnover effects, therefore, should be higher when departure of organizational members involves partners rather than associates (see Haveman, 1993; Dobrev, 1999). In professional service organizations, the partners' (e.g., the owners') human capital is more germane to the organization's profit potential than that of the associates. As Pennings, Lee and van Witteloostuijn (1998) point out, partners, as residual claimants, have a greater incentive to use their human capital for the growth and the performance of an organization than do associates. Ownership comes with sticky property rights and diminishes a partner's propensity to leave. Partners, therefore, face higher exit barriers. Clients prefer and have stronger relations with a firm's partners than its associates: they expect the senior partners to have the solution to their specific problems, because managing and advice-giving "are the main roles of the senior partners" (Smigel, 1969: 160). While partners almost always exit voluntarily, the firm usually terminates associates when they cannot complete the tournament to partnership.² Furthermore, a partner's departure triggers a demographic shift in the firm's ownership structure. In short, they are more critical for a firm's performance and survival as they have greater influence on organizational outcomes (Hambrick and Mason, 1984; Sørensen, 2000).

Although we indicated that defecting associates represent comparatively 'marginal' human capital with less harmful turnover effects, we still hold their turnover to also entail loss of valuable intangible assets. The departure of associates has often detrimental effects. An associate, in fact, "might walk off with the firms' clients or, often more realistically, depart

with skills – or clients of his own – that the firm has paid the associate to develop” (Galanter and Palay, 1991: 99). Whereas the loss of associates’ human and social capital is disruptive, it should be less disruptive than that of partners. Therefore, professional mobility should be decomposed into movements that involve partners and those that involve associates. This leads to the following hypothesis:

Hypothesis 3: The impact of organizational turnover on organizational dissolution is stronger when it involves partners rather than associates.

Furthermore, building upon the spatial heterogeneity hypothesis, we also predict the impact of the loss of high status employees to vary with the degree of geographical proximity. The competitive implications ensuing the reallocation of their human and social capital are especially pronounced when such employees join a competitor or start up a new venture in the proximity of the focal firm. We then hypothesize:

Hypothesis 3a: The impact of organizational turnover on organizational dissolution within the same geographical area is stronger when it involves partners rather than associates.

DATA

The data we use in this paper are similar to those that Pennings, Lee and van Witteloostuijn (1998) analyze in their study of the effect of organization-level changes in human and social capital on organizational dissolution. Data consist of information about individual professional accountants and individual organizations, and were collected from the membership lists (or directories) of accountant associations with one- to five-year intervals.

The database records observations on each identified firm approximately every two years, covering a total of 110 years in 53 observation points (to be more precise the percentage of our temporal gaps are 1year: 24%, 2years: 60%, 3years: 6%, 4years: 8%, 5years: 2%). These lists provided information on the name, address, background education and status (partner or associate) of each professional accountant within the association. We reconstructed the histories of individual organizations by first aggregating individual level data to that of the firm. The data cover the entire population of Dutch accounting firms during the period 1880-1986. The complete industry comprised 1920 firms over the 106-year period. Choosing one industry as our research setting reduces unobserved heterogeneity at the firm level.

Dissolution in this paper is consistent with that proposed by Boone, Bröcheler and Carroll (2000) and by Phillips (2001) who define it as exit from the market. We define the entry year as the first year that a firm appears in our directories. The year that a firm is no longer listed is considered the year of exit. In other words, the time of dissolution coincides with the year in which we observed zero people working for the firm. 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, Bröcheler and Carroll, 2000: 368). Thus, organizational dissolution encompasses different types of exit, ranging from the case where a single proprietorship vanishes as its owner is no longer listed in the C.P.A. (i.e., certified professional accountant) directories, to the case of dissolution by acquisition (but the professional accountants of the acquired organization keep working under the acquiring organization), to the case of dissolution by merger between two or more organizations.³ In all such cases our dichotomous dependent variable was coded as one and the firm was removed from the risk set. The notion of organizational dissolution we use in

this paper explains why the final number of firms differs from that of Pennings, Lee and van Witteloostuijn (1998). Furthermore, since our observation period ends in 1986, our final population is also smaller than that examined by Boone, Bröcheler and Carroll – whose study extends till 1992.

We chose the “province” to test the hypothesis on spatial heterogeneity. We divided the overall population of accounting organizations into 11 sub-populations – each corresponding to a different province of The Netherlands. We assumed that they represent a distinct selection environment. Provinces in The Netherlands are important administrative and political units (see Boone, Carroll and van Witteloostuijn, 2002; Lee and Pennings, 2002). Roughly comparable with respect to many resource dimensions, the provinces have clear and distinguishable local identities. For instance, some provinces are predominantly Protestant while others are mainly Catholic. Due to their small size, many organizations compete at the local (province) level and their critical resources (talented professionals and new clients) are local as well. Furthermore, the capital investments to start up a new venture are low. The accounting service industry is in fact “entirely a personal service industry” (Benston, 1985: 47). Figure 1 illustrates its evolving fragmented character during the window of the present study. Concentration of the industry was measured by using the relative market share of the four largest firms (*C4*) over the period 1880-1986. Therefore, although some firms have over time expanded the scope of their activity beyond the provincial boundaries, the province still ought to be considered the relevant environment for most of the firms.

Starting in the late 1960s, the Dutch accounting service industry has witnessed several fundamental regulatory changes. Because of more stringent requirements – for example, the need for higher levels of education and experience, and the examination to become C.P.A. – the entry of potential competitors has been restricted. Small firms appear to be most disadvantaged by the costs imposed by regulations. The industry has indeed evolved from being virtually unregulated to being extensively regulated. In particular, four major regulatory changes have encompassed both the supply and the demand of professional accounting services. In 1966, with the Law on Registered Accountants, one professional organization or NIVRA (Nederlands Instituut van Register Accountants) was created. Since then, every professional accountant in public practice has become one of its members. The organization has the right to establish disciplinary rules and grant the Registered Accountant (RA) license. The license is granted on condition that a prospective auditor acquires “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)” (Maijor and van Witteloostuijn, 1996: 555). The regulation has then greatly contributed to the enhancement of the quality of human capital within the industry. Rules of conduct for auditors were prescribed with the Professional Code of Registered Auditors in 1972.

As to the demand side, in 1970 the Act on Annual Accounts of Companies (which took effect in 1971) enlarged the number of firms required by law of disclosing audited annual accounts. In addition to ‘open’ public companies, large private firms and cooperative societies were also included. Finally, in 1983 the number was further enlarged with the Title 8 of Book 2 of the Civil Code: every company, public or private, and every cooperative

society was forced to disclose audited annual accounts. After the promulgation of definitive guidelines in 1984, the obligation remained less compulsory for small and medium-sized firms that were “allowed to submit abridged annual accounts” (Boone, Bröcheler and Carroll, 2000: 366). By forcing demand for audit services (auditing and disclosure requirements), the 1970 and 1984 regulations have contributed to enhancing even more the value of human capital. While raising the entry barriers into the profession, these regulations have also fostered the demand for auditing services by increasing the number of firms requiring such services. As human capital has become a scarce resource, the retention of talents is therefore crucial for the long-term viability of a firm.

INDEPENDENT VARIABLES

We tested Hypothesis 1 by creating a time-varying variable – *Turnover* – by taking the logarithm of the number of professional accountants that left the focal firm in a given year.⁴ The exit of individuals embraces all cases in which a professional leaves the organization, whether they remain within the same industry, change industry, retire, take time off the labor market, etc. We logged the variable because, like other studies, we assume that the impact of the number of departing members would increase at a decreasing rate (e.g., Rao, Greve and Davis, 2001). While certain levels of turnover are associated with certain disruptions, the defection of the very first member is likely to be much more dramatic in jeopardizing the integrity of professional partnerships. Partners embody a cohesive group, with a strong *esprit de corps* where admission occurs only after a lengthy 10-12 year tournament. A walkout is profoundly disturbing and might expose a larger fissure and an erstwhile stable structure becomes a house of cards. Furthermore, lower status employees often follow higher status employees when the latter leave the firm (Rajan and Zingales, 2001). In their study of

turnover Krackhardt and Porter (1985) have suggested that the defection of one's confidant often engenders a 'snowball effect' on the premise that "the effects of turnover on stayers will not be uniformly nor randomly distributed among the stayers in the organization. Rather, these effects will be localized and focused on those stayers who are closest to those who left. The social network, then describes the topology of forces that reverberate throughout an organization when someone leaves" (Krackhardt and Porter, 1985: 246). It is therefore plausible to argue that the first defection is much more harmful for a partnership compared to subsequent defections that are often triggered by the very first one. That is why we assign disproportionately more weight to initial exits. The disproportionate effect of the first mover can be dramatized with a twisted metaphor: the very first person breaking the partners' truce has an undue influence on its aftermath (Nelson and Winter, 1982).

A potential problem in our analysis is the direction of causality. Turnover might be an effect rather than a cause of organizational dissolution as individuals are more likely to quit their job when their firm is performing poorly and then 'death is sneaking around the corner' (see Wagner, 1999). To get around this issue, we lagged the variable by one period to ensure exogeneity with respect to the dependent variable (e.g., Swaminathan, 2001). Since in our data a period ranges from a one- to a five-year interval (for 76% of the firms in our database one-period lag corresponds to 2 to 5 years), the one-period lag allows controlling for the risk of reverse causality. By the same token, the impact of turnover on the risk of dissolution is not the same for all firms, but is mediated by the level of organizational vitality (Hypothesis 1a). While dying organizations tend to lose more individuals than they gain, more vital organizations enjoy the ability to attract and retain individuals, and even grow in size over time. In the case of 'near-death' organizations high levels of turnover are more likely to

accelerate than cause the dissolution of an existing firm. Therefore, in order to correctly assess how turnover influences the risk of organizational dissolution, we created a time-varying variable – *Vitality* – given by the difference between the logarithms of entries and exits of organizational members. We chose this formulation instead of taking the log of the difference between the number of entries and exits because when this difference is negative the logarithm cannot be computed.

Since many firms in our sample are single proprietorships (size = 1), in the absence of replacement, the departure of the owner of the firm amounts to organizational dissolution. We then restricted our analysis to those individual firms where the departing individual is replaced with a new one (e.g., the son who follows into the father’s footsteps). In other words, we only look at those cases where turnover does not sanction the outright end of a firm’s professional activity because the replacement ensures its continuity at least for a while. We also estimated all models restricting the analysis of the impact of turnover to firms with size > 1. Though not reported, the results are similar to those presented in the paper.

Besides retiring, becoming unemployed or even abandoning the industry, departing individuals can join a competitor or start up a new venture. In the last two cases individuals remain in the industry after having left their firm and are only a subset of all defecting individuals. In the second part of the paper, therefore, we focused on those movements where organizational members joined a competitor or founded a new firm. Since we are already controlling for the ecological dynamics of competition, with respect to the effect of the loss of social capital it is difficult to untangle the difference between movements towards a competitor and new foundations.⁵ In keeping with research on spatial heterogeneity, we

distinguished between movements of professional accountants within or across provinces (Hypothesis 2). In particular, we created two variables – *MemberExit-within-Province* and *MemberExit-across-Provinces* – that measure how many individual C.P.A.s each year start working for another organization or found a new venture within the same province or a different one, respectively. Following the same logic as for *Turnover*, we expressed these two variables in logarithmic form.

Furthermore, we split the previous two variables into four variables – namely, *PartnerExit-within-Province* and *PartnerExit-across-Provinces*, *AssociateExit-within-Province* and *AssociateExit-across-Provinces* – by counting the number of movements that involve partners and those that involve associates both within and across geographical areas (Hypothesis 3 and Hypothesis 3a). These new variables – again expressed in logarithmic form – measure the number of partners and associates that each year left the focal company to join a competitor or start a new venture within the same province or a different one.

CONTROL VARIABLES

As the history of the Dutch accounting service industry has been marked by many important historical events that might well account for organization dissolution in specific years, in our models we included several control variables. In particular, we sought to disentangle exogenous forces of evolutionary change, which are discernable at either the national or the entire industry levels (e.g., worldwide conflicts or changes in the institutional environment, etc.), from endogenous forces of evolutionary change that, on the contrary, operate at a lower level (e.g., movements of professional accountants).

Two dummies were created for governmental regulation dealing with *World War I* conditions during 1914-1918 and for the occurrence of *World War II* (1941-1946). The government *Regulation of 1929*, in the wake of the Great Depression, was presumed to be most impactful during 1929 and 1930 (1 if year = 1929 and = 1930, 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). The effect of the regulatory changes enforced in 1971 and 1984 – which significantly heightened the demand for audit services – was captured by two dummy variables, namely *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. We tried to estimate the extent to which more general phenomena affect the creation of new organizations (e.g., bandwagon effect) with the inclusion of density at the national level – *National Density* – and at the provincial level – *Focal-Province-Density*. A measure of the level of concentration of the industry – *C4*, e.g., the total market share of the top 4 firms – was also included to control for the impact that the number of organizations populating the industry has on organization dissolution. In the presence of high levels of concentration, just a few organizations control most of the available resources (Bain, 1956; Porter, 1980). But the risk of dissolution might also be influenced by how many firms were created or disappeared each year – which is a reflection of the degree of munificence of the environment. We then included two variables – *BirthTotal* and *DeathTotal* – that measure the number of firms founded and dissolved nationwide the previous year, respectively.

To control for spatial heterogeneity at the province level, we created three variables. The first is given by the number of inhabitants in each province – *Provincial Inhabitants* – a time-varying variable deemed to capture variations in carrying capacity (e.g., number of potential clients). The other two variables – *BirthProvince* and *DeathProvince* – control for the number of firms founded and dissolved the previous year within a given province, respectively. The considerations made before for likewise variables nationwide do still hold in this case.

Several control variables were also created at the organization level. We controlled for the Leverage ratio – *Leverage* – namely the number of associates per partner for each year. According to Maister (1993), when the ratio is high there are fewer career opportunities and higher levels of turnover. Young talented professionals are in fact likely to seek new job opportunities elsewhere. A high value of the Leverage ratio is also an indicator of firm vitality and in particular of its bargaining power relative to its employees. Since an inverse relation has been observed between an organization’s life chances and the probability of promotion (Phillips, 2001), the associates that cannot complete the tournament to partners have a strong incentive to leave. While “occupying strong competitive positions allows a firm to attract and retain employees seeking to obtain a share of the firm’s resources, the firm is able to deny the same resources to many employees without severe penalty” (Phillips, 2001: 1064). We measured organization size – *Size* – by taking the logarithm of the number of accountants associated with an organization each year. Large organizations provide associates with more career opportunities and by implication are more likely to retain talented professionals. We also controlled for the number of years elapsed since the founding of an organization by creating the variable *Age*. Since we do not have annual

observations, following Petersen (1991), we coded the variable taking the midpoint of each period.

Finally, we sought to estimate the role of experiential knowledge and the duration of the relationships with clients at the firm level by creating the variable *Local Experience*, that is given by the logarithm of the sum of the number of years of provincial experience of all organizational members. Although created at the firm level, the variable is positively related to the number of years organizational members have spent within the focal province. Therefore, *Local Experience* does not necessarily increase with organizational age (the correlation value is only .0066), but mainly varies with the amount of local experience individuals have accumulated over time. This implies that “otherwise identical organizations with persistent differences in turnover will evolve very different tenure distributions, with implications for stability and change in organizational culture” (Baron, Hannan and Burton, 2001: 963). Table 1 reports the pairwise correlation coefficients of the variables we use in our model. In the Appendix we also provide a summary description of all variables used in estimating our models.

MODEL AND METHOD

In building the dataset, we considered the year in which the organization appeared for the first time on the Register of Accountants as the founding year, whereas the last year of appearance as the year of dissolution of the same organization. We divided the life of each organization in organization-years (Allison, 1984; Tuma and Hannan, 1984). The final dataset includes the life of 1920 firms divided into 17,491 year-segments, accounting for a

total of 1661 exits. For the analysis we used event history techniques. Our dependent variable is the instantaneous rate of transition from survival to dissolution, defined as:

$$r(t|X[t]) = \lim_{\Delta t \rightarrow 0} \frac{\Pr(t + \Delta t > T \geq t | T \geq t)}{\Delta t}.$$

Different functions of time and different covariates can be used to model the hazard rate of each organization. Given the inconsistent findings on parametric formulation of the rate of age-dependence, a less restrictive way to model it has been recently suggested (Barron, West and Hannan, 1994). For this reason, we chose to use a flexible model, the *piecewise exponential*, which allows the rate to vary in an unrestricted fashion from one interval to the other at pre-selected ages.⁵ More precisely, the age of an organization is divided into intervals and the hazard is constant within each interval but can vary across them. We define a set of J intervals, dividing the age variable at precise points $(a_1, a_2, a_3, a_4 \dots a_j)$, where $a_0 = 0$ e $a_j = \infty$. The interval J is given by $[a_{j-1}, a_j)$ and the hazard of the firm i is defined by:

$$r_j(a) = \mu_j \exp[\beta'X_i], \text{ where } a_{j-1} \leq a < a_j$$

This formulation allows the intercept of the *log-hazard function* to vary at different cut-points (Allison, 1995). Our choice of the intervals was driven by the principle of having time segments that are long enough to contain a comparable number of events (i.e., exits). We then divided the age of the firm in the following six segments: Age1 [0.5-3 years), Age2 [3-6 years), Age3 [6-10 years), Age4 [10-16 years), Age5 [16-29 years) and Age6 [29- ∞). As already pointed out, the covariates were lagged by one period to avoid problems of simultaneity. We

estimated the hazard rate of the organization i at the age a – namely $r_i(a)$ – as a function of a vector of firm characteristics, \mathbf{w} , and of a vector of environmental variables measured at different levels of analysis, \mathbf{z} , using the following model:

$$r_i(a) = \mu_j \cdot \exp[\varphi' w_{ia} + \gamma' z_{ia} J],$$

As some of the models described in the next section are not nested, following Lomi (1995), we compared them using the $\bar{\rho}^2$ statistics for each model specification (Horowitz, 1983). The $\bar{\rho}^2$ statistics is a likelihood ratio test adjusted to account for differences in degrees of freedom across non-nested models and is defined as follows:

$$\bar{\rho}^2 = 1 - \frac{L_f - \eta_f}{L(0)}$$

where \mathbf{L}_f is the log-likelihood of the full model, η_f is the number of parameters, and $\mathbf{L}(0)$ is the log-likelihood of the restricted model containing a constant term only. The model with the highest $\bar{\rho}^2$ value is the one that fits best the data. We introduced fixed effects at the province level to account for systematic geographical differences in dissolution propensity. Finally, all the estimates were obtained using Maximum Likelihood estimation method using version 7 of STATA.

RESULTS

Table 2 presents the maximum likelihood estimates for piecewise exponential models of organizational dissolution. Model 1 includes all the control variables. In Model 2, we added

the variable *Turnover* to test Hypothesis 1. In Model 3, we introduce the main effect of *Vitality* and its interaction with the variable *Turnover* to test Hypothesis 1a. In Model 4, we introduced the variables *MemberExit-within-Province* and *MemberExit-across-Provinces* to test Hypothesis 2. In Model 5, we replaced the previous two variables with *PartnerExit-in-Province*, *AssociateExit-in-Province*, *PartnerExit-across-Provinces* and *AssociateExit-across-Provinces* to test Hypothesis 3 and Hypothesis 3a.

The baseline model (Model 1) with all control variables shows that the government regulations following the 1929 crisis affected the risk of organizational dissolution. Whereas the creation of the single association (NIVRA), the regulatory measures taken to withstand the occurrence of *World War II* and the boost in the demand for auditing services caused by the 1984 regulation raised such risk, the period between 1971 and 1984 reduced it. The level of industrial concentration (*CA*) is in the expected direction but non-significant. Moreover, the effect of the dummies related to the *Age* variable suggests the potential existence of a liability of newness: accountant firms are more likely to dissolve when they are very young.

Partial support for the spatial heterogeneity hypothesis can be found in the coefficients estimates of the variables measuring the impact of ecological variables on failure rates, i.e. the number of firms born (*BirthProvince* and *BirthTotal*) and dissolved (*DeathProvince* and *DeathTotal*) during the previous year within the same province and nationwide, respectively. The impact of births and dissolutions at the provincial level is significant and the coefficient estimates are two to five times greater than the coefficient estimates at the national level. These results suggest that the survival chances of the focal organization are mainly geared to the evolutionary dynamics of local populations. Furthermore, greater experiential knowledge

at the geographical area (*Local Experience*) level enables a firm to reduce the risk of dissolution.

The estimates obtained for the coefficient of the variable *Turnover* support our Hypothesis 1 (Model 2). A turnover event significantly raises the risk of dissolution. For example, when 5 members leave their firm, the hazard rate of organizational dissolution increases by approximately 20% [$\exp(0.115 \cdot \ln(5))$]. Yet, the effect of turnover on the risk of dissolution is mediated by the degree of organizational vitality (Hypothesis 1a). As Model 3 indicates, while the main effect of the variable *Vitality* (i.e., the effect of vitality for a firm which does not experience any exit) is not significant – though in the expected direction – its interaction with *Turnover* is statistically significant. In other words, facing turnover events, vital firms are more likely to cope with the risk of dissolution. Increasing levels of organizational vitality offset the costs of losing organizational members. For instance, if 5 members leave the focal firm, the risk of dissolution is proportional to the amount of new professionals the firm is able to attract: just replacing 1 of the 5 departing members reduces such risk from 20% to only 3% [$\exp(-0.018 \cdot (\ln(1) - \ln(5)))$]. When the firm succeeds in replacing all defecting members, for any new additional member that a firm is able to attract the risk of dissolution is completely offset and lowered by about 1% [$\exp(-0.0185 \cdot (\ln(6) - \ln(5)))$].

Model 4 provides support for Hypothesis 2. The risk of organizational dissolution increases when turnover translates into the migration of professionals from firm to firm within the same province or outside. Adding these two variables improves significantly the fit of our model ($\chi^2[L_4 | L_3] = 170.2$ with 2 d.f.). The coefficients of the variables measuring these movements – *MemberExit-within-Province* and *MemberExit-across-Provinces* – are both highly

significant and in the expected direction. Yet, the migration of professionals has a stronger effect when it occurs within the same province than when it occurs across provinces [as indicated by the Chi-squared statistics: $\chi^2=5.33$ $p < .05$ with 1 d.f., which we obtained using the TEST command in STATA]. For example, when 5 members leave their firm to join a competitor or found a new venture within the same geographical area, the hazard rate of organizational dissolution increases by approximately 19% [$\exp(0.105*\ln(5))$]. Interestingly enough, when we include in the model the variables that capture the movements of professionals from firm to firm within the same province or across provinces, the variable *Size* becomes statistically significant. This change in magnitude of the size effect suggests that only after accounting for the geographical distribution of such movements does the liability of smallness (Freeman, Carroll and Hannan, 1983) become apparent.⁶ Similar considerations also hold for the main effect of vitality: after controlling for the geographical distribution of professionals' movements, the positive effects of attracting new human and social capital emerge.

In Model 5 we distinguished between movements involving partners and movements involving associates. The risk of organizational dissolution is much higher when partners leave the focal firm to join a competitor or found a new firm, especially if the latter is located within the same geographical area [$\chi^2=5.4$ $p<.05$ with 1 d.f.]. This suggests that part of the increment in the risk of organizational dissolution (18% for 5 exits) is captured by the movements of partners from firm to firm within the same geographical area [$\exp(0.102*\ln(5))$]. Although movements involving associates have a positive effect on the risk of dissolution, the effect is even stronger when such movements occur in the proximity of the focal firm. This result is not so surprising due to both theoretical reasoning (Galanter

and Palay, 1991) and the right skewed distribution of the variable *Size* in our data. Furthermore, the impact of movements of associates is smaller than that of partners, both within and outside the same province [$\chi^2=6.15$ $p<.05$ with 1 d.f; and $\chi^2=6.85$ $p<.05$ with 1 d.f., respectively]. Thus, these results provide support for Hypothesis 3 and Hypothesis 3a.

It is worth noting that the value of the $\bar{\rho}^2$ – used to compare non-nested models – shows that the goodness of fit improves as we add new covariates. In particular, the model with all main effects (Model 5) fits the data better than any other model. Overall, the estimates displayed in Table 2 provide support for all hypotheses.

DISCUSSION AND CONCLUSIONS

In this paper we sought to investigate the local effect of organizational turnover on firm survival. To this end, we dealt with four issues. First, we demonstrated the presence of strong effects of turnover on organizational dissolution. Second, we provided evidence on how the effect of organizational turnover is mediated by firm vitality, namely its ability to acquire and retain stock of human and social capital. Third, we showed how propinquity is crucial in moderating turnover's effect on dissolution. Finally, we documented how such effects are stronger when they involve partners as distinct from associates.

Organizational turnover has been described as a disruptive event that augments the risk of firm dissolution, especially for professional service firms that compete not only for clients, but for human capital as well. Their social capital is likewise tied up with their current roster of professionals and becomes compromised when some of them leave. The harmful effects persist when we control for organizational vitality. When the firm is vital, the implications of

turnover become wholly different and firms seem to endure few adverse consequences. The professionals' exit is most damaging to the firm when it unfolds at the local level and involves partners rather than associates. Full account of the impact of organizational turnover, therefore, requires a more fine-grained examination of the exit behavior of individuals, and the characteristics of their firms in their geographic locale. These results provide insight into the link between personnel flows to population level processes, which to date has remained largely unexplored (Wade et al., 1999: 136).

A troubling issue that this paper sought to address revolves around the direction of causality: does turnover increase dissolution rates? Could the expectation of dissolution induce employees to leave the firm in as much as a burgeoning firm engenders strong employee commitment? This is a central problem of research regarding turnover, especially in periods of deterioration when employees run for the nearest exit. In his provocative paper, "The life history of cohorts of exits from German manufacturing," Joachim Wagner (1999) finds that many employees leave shortly before a firm declares bankruptcy, which is described with a bleak metaphor as 'death sneaking around the corner.' Likewise, we could ask whether the professionals in our data leave as a preemptive act towards an imminent organizational death. Even if lagging turnover by one year is conventionally presumed to forestall this reverse causality fallacy, one could still ask whether an employee's exit is indeed a consequence of 'death sneaking around the corner.' Yet, turnover notwithstanding, when employment levels remain stable or expand – which is an indication of organizational vitality – we can attribute firm dissolution to turnover. Our findings and interpretations are consistent with those of Phillips, who shows how the probability that individuals leave the

focal firm to start up a new venture (i.e., a parenting event) is not “a consequence of a high predicted rate of failure for an organization” (Phillips, 2002: 37).

While we would like to acknowledge the positive aspects of turnover, our findings suggest that its effect on performance is more complex. By providing a multi-dimensional analysis, we have shown that controlling for significant aspects at several levels of analysis (*member status, organizational vitality, ecological propinquity*), turnover impacts the well being of organizations. In this sense, our study provides a more fine-grained answer on the conditional implications of turnover for firm dissolution.

The finding that the effects of turnover are largely regional hints at the embeddedness of organizational practices and relationships (Uzzi, 1997). Social networks, whether internal or external, become cultivated locally and transforming them may translate into diminished organizational performance. Controlling for firm vitality, the exit of professionals very often amounts to jolts, upheavals and other forms of organizational change and discontinuity. Such changes are most paramount when turnover occurs within the focal firm’s immediate geographic proximity. In keeping with the hypothesis on spatial heterogeneity, competition among firms tends to be local. Geography and inter-firm mobility have important implications on firm survival. However, other ways to disentangle these relationships may produce even stronger results. For example, the choice of province as a meaningful social entity for uncovering spatially heterogeneous hazard patterns might be questioned. Provinces are administrative units with tenuous boundaries, less so cohesive, well-bounded social communities. Therefore, our results should be much stronger if we had geographically less ambiguous social entities – for example, “conurbations,” Statistical Metropolitan Areas

(SMAs) or industrial districts. Nevertheless, our study of provinces signals that geography should not be disregarded and that in fact propinquity embodies an important influence of localized learning and inter-firm knowledge transfer.

Our study investigates the spatial impact of organizational turnover on organizational dissolution. Yet, the paper provides only an incomplete synopsis of what is obviously a multi-level phenomenon. Individual level phenomena (the departure from an existing organization) trigger phenomena at a higher level (organizational and ecological changes) that ultimately create the conditions for the former to come about. In this sense, the results show how turnover is an important endogenous force shaping the evolution of localized populations of organizations. Individuals' choice behavior does not occur in a vacuum. Rather, it is often determined by availability of vacancy in other occupations and other firms. Population level conditions obviously also play a major role in the market for professional labor (Haveman and Cohen, 1994). Frameworks and analysis strategies for jointly considering different levels should therefore be developed. The present study ought to be seen in a wider context where individual, firm and population or industry level factors figure prominently in the understanding of micro-motives and macro behavior (Schelling, 1978).

A related question – which our data cannot properly address either – is whether spatial heterogeneity is rooted in contextual or cognitive differences. Distinct geographical areas differ because of institutional, historical, socio-economic reasons that ultimately affect the type and the amount of resources locally available. On the other hand, as Porac et al. (1995) demonstrated, firms are likely to see as competitors those firms that operate in their immediate proximity. This also echoes with our study where firms are small and clients tend to be local. Yet, only a more fine-grained analysis, with qualitative data can shed light on the

pre-eminent validity of cognitive explanations. Future research, therefore, may find this question worth exploring.

The results of our analysis are partly idiosyncratic to the industry. However, we believe they hold also in other professional services sectors such as investment banking, law, venture capital and consultancy. Similar mobility patterns are also common in high-tech industries (e.g., software, biotech, semiconductor) where the survival of existing organizations crucially hinges on knowledge-based resources. In those industries where reputation plays a critical role (e.g., fashion) turnover may significantly affect the hazard rate of organizational dissolution. Not surprisingly, firms often strive to retain key employees through fringe benefits, non-vested stock options, binding contracts and other golden handcuffs (Doeringer and Piore, 1971; Galanter and Palay, 1991; Milgrom and Roberts, 1992).

We believe our study to have successfully isolated some of the micro determinants of evolutionary processes. Choices of individuals can materially shape the competitive conditions of firms and their evolution over time. Given the local nature of the industry, we have also shown the impact of individual actions to be particularly pronounced when they choose not to drift away too far from their former firm. Only if the firm is vital and robust in its growth prospect, can it suspend the adverse implications of turnover. The joint consideration of individual, geographic and organizational conditions sheds important insights on the multi-level realities of organizational performance and survival.

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FOOTNOTES

¹ They define social capital as “the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and the assets that may be mobilized through that network” (1998: 154).

² Although our data do not allow us to precisely distinguish cases of voluntary turnover (resignation) from cases of involuntary turnover (dismissal), in general partners interrupt voluntarily their relationship with their firm, while associates are asked to leave (Maister, 1993). For a first empirical investigation of the factors affecting voluntary and involuntary turnover see Stumpf and Dawley (1981).

³ Because of international mergers and acquisitions starting in the late 1960s, the Dutch accounting service industry has become increasingly concentrated ever since. Therefore, we checked whether the results might be affected by our notion of dissolution. In particular, we conducted a sensitivity analysis including only the data till the end of the 1960s. The results, which are available from the authors, are qualitatively similar to those presented in the paper.

⁴ We estimated the model also expressing *Turnover* in relative terms (i.e., exit rate). The results turned out to be equivalent.

⁵ Given the high correlation between these two types of movements (.70), in a previous version of the paper we used dummy variables to reduce multicollinearity. Though not displayed, the results were equivalent.

⁶ The estimates obtained using a *complementary log-log* model, here not reported, offered values qualitatively similar to those presented in the paper.

⁷ We gratefully thank an anonymous reviewer for suggesting this interpretation of our results.