# MIMICRY AND THE MARKET:
# ADOPTION OF A NEW ORGANIZATIONAL FORM

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ABSTRACT

This paper investigates institutional changes in the Dutch accounting industry during the period 1925-1990. While all firms were composed of partners only before 1925, some among them began to partition professional accountants into partners and associates (PA-form) and the PA-form became a dominant form. We suggest that the institutional change was the result of an interaction between selection at the population level and imitative adoption at the firm level. In the empirical part, we focus on the effect of negative selection on imitation behavior, and propose that strong market feedback favoring the PA-form enhanced its legitimacy, which in turn fostered imitative adoptions. We also hypothesized on the spillovers between firms: that the market feedback differentially affects the adoption of PA-form on the basis of firm idiosyncratic filters such as network embeddedness to adopters, percentage of adopters among similar-sized firms and geographically proximate firms. The analysis produces results that are supportive of our hypotheses. We conclude with a discussion of innovation diffusion in the private sector as a legitimization process, where this process unfolds at both the industry and firm levels of analysis.

# INTRODUCTION

Why are organizations, occupying the same environmental niche or "organizational field," similar in structure? Two streams of research have sought to answer this question. Population ecologists (e.g., Hannan & Freeman, 1989) suggest that the environment selects firms with structural elements that provide the highest fitness value. The competitive process to which firms are exposed winnows out those that lack an adequate structural template (Hannan & Freeman, 1977, 1984). In contrast, institutional scholars have argued that firms adaptively adopt a certain structure to enhance their legitimacy, thus converging towards a common template in their so-called "organizational field" or market (e.g., DiMaggio & Powell, 1983; Meyer & Rowan, 1977).

The institutional process has been sharply distinguished from the competitive process as shown by earlier institutional studies when they sought to explain structural changes and innovation (e.g., DiMaggio & Powell, 1983; Meyer & Rowan, 1977). More recently, however, several institutional writers have acknowledged that competitive and institutional processes interact with each other in producing convergence in structure (e.g., Powell, 1988, 1991; Scott, 1987; Scott & Meyer, 1991).

While conceding the interaction of the two processes in producing institutional changes, those authors did not clarify the nature of the interaction. The present study proposes hypotheses on that interaction by combining tenets of population ecology and institutional theory. We then test those hypotheses with the partner-associate structure adoption in a population of Dutch accounting firms from 1925 to 1990.

When firms vary in their structural arrangements, their selection environment favors firms having a specific structural arrangement—an observation that is in line with the presumption of competitive isomorphism (Hannan & Freeman, 1977, 1984). Those very competitive processes trigger institutional processes. The higher growth and survival rate of those firms amounts to "market feedback" that shapes managers' cognitive premises—both directly through mere exposure, and indirectly through consultants and

other professionals who disseminate that feedback in their rhetoric and in their peddling of the new template (Abrahamson, 1997). In other words, the template gains legitimacy through market feedback favoring adopting firms. That enhanced legitimacy and subsequent changes in a manager's cognition foster mimetic isomorphism (DiMaggio & Powell, 1983).

Though market feedback alone produces organizational change and innovation, several firm characteristics render the firm more susceptible to that information. We propose that a firm's network with adopters, their physical location, and clusters of size-equivalent firms filter the information about innovation and its benefits. Those firm characteristics augment the influence of market feedback on the adoption decision.

Our belief is that this study will significantly push the theory of institutional change into new directions by integrating population ecology and institutional theory. This becomes more apparent as we propose and test a very important, but often neglected, aspect of institutionalization—market feedback—and examine how that feedback gets filtered through a firm's specific context.

## RESEARCH SETTING

The accounting sector has become an important segment of the ever-growing service sector. This sector has expanded exponentially, and has become increasingly globalized. Before the advent of a partner-associate form (hereafter PA-form) in 1925, the Dutch accounting sector had been composed of either single proprietors or small firms with partners only (hereafter P-form). After the advent of the PA-form, we observe two distinct types of organizational forms: some firms have associate professionals as well as partners (hereafter PA-firms), while others have partners only (hereafter P-firms).

Figure 1 shows the number of PA-form adopters in each observation interval and the number of survivors among them. Four comparatively large accounting firms adopted the PA-form in 1925. By 1990, 301 accounting firms had adopted the structural

innovation. Figure 2 shows the changes in the proportion of PA-firms and their market share or rather their relative "mass" (Winter, 1990) as measured by the proportion of accountants who were affiliated with PA-firms. PA-firms had gradually increased their collective mass and more than 80 % of practicing accountants were affiliated with those firms in 1990.

**Insert Figure 1 about Here**

**Insert Figure 2 about Here**

In PA-firms, partners participate in important strategic decisions and take the profits from operations, while associates receive the command and guidance of partners and usually receive a fixed annual salary (Sherer, 1995). In auditing financial statements, a partner forms a team with associates. As "partner-in-charge" of an audit, the partner signs off the completed audit work and is responsible to the client and the users of audited information for the services provided (Greenwood, Hinings, & Brown, 1990). Associates in an auditing team attest to the accuracy of financial statements under the guidance of the partner but do not have a formal responsibility for audited results. Accounting firms usually hire freshly minted accountants as associates, monitor their ability and aptitude for 8-12 years, and promote some of them to partners (cf. Galanter & Palay, 1991; Gilson & Mnookin, 1989).

Each partner usually enjoys an equal share of partnership and is entitled to a one man-one vote in strategic matters such as mergers and acquisitions (Greenwood, Hinings, & Brown, 1994). As PA-firms have grown and become larger, they have evolved into more mechanistic forms and have become less collegial (Hinings, Brown, & Greenwood, 1991; Tolbert & Stern, 1985). Several strategic decisions that had been decided through consensus among all partners are delegated to the managing partners or to special committees.

In P-firms, all participating professionals are partners. A P-firm is very similar to a peer group described by Williamson (1975), since professionals have equal voice and

status, and no authority differentiation exists among them. Since all partners share individual and collective unlimited liability, P-firms usually maintain unanimous decision rules in recruiting a new partner. Thus it is very unlikely for professionals to form a large-scale P-firm. It should therefore not surprise us that PA-form advocates (e.g., Maister, 1993) implore partnerships to employ associates.

What surfaces from the rhetoric regarding the superiority of the PA over the P-form? The purveyors of the PA-form rhetoric focused primarily on these governance structures as other forms of organizing, for example incorporation, usually are legally blocked. Galanter and Palay (1991) and Russell (1985), for instance, view the PA-form as a condition of firm growth by fostering consensus and trust, while maintaining opportunities for expansion. Trust and homogeneity achieved by the ongoing tournament to partnership decrease the threshold for reaching consensus. Writers and consultants who articulated and embellished the superiority of such governance structures pointed to the advantages of associates' tournament such as screening and socialization, when professional services firms evolved towards large partnerships with a well-established *esprit de corps*, and with a reputation of reliability and reproducibility.

The template is so widespread that we have difficulty envisioning a partnership whose design does not embody this template. The PA-form has emerged as an "obvious" or natural template for designing professional firms where law does not allow incorporation, since many of the large firms in professional services sectors such as accounting, law, and consulting have resorted to this form. The form should be viewed as an important structural breakthrough, since, compared to the P-form, this innovation enabled professional service firms to economize on coordination and governance costs when they became large (Galanter & Palay, 1991; Russell, 1985). In a sense, the significance of the PA-form for professional service firms parallels that of the M-form for diversified industrial firms.

This study explores diffusion of the PA-form in the Dutch accounting sector. Its data furnish access to a very unique research setting, where we can explore the effects of population level selection on the adoption of a new structural template. In most current diffusion studies, sampled actors were not changing overtime, nor do they belong to a well-bounded entity. For instance, Davis and Greve (1997) used the *Fortune* 500 largest U.S. industrials in analyzing the diffusion of poison pills. As a result, those studies explored the effect of such actions of other firms in the adoption of new practices and could not incorporate the effect of population level selection. In contrast, our data provide market selection information such as firm founding and dissolutions, as well as firm growth, and thus allow us to analyze the effects of market selection on the adoption of a new structural template. And we are able to show that spillovers between firms are reinforced by contextual and local conditions.

## THEORY AND HYPOTHESES

The historical observation regarding the Dutch accounting industry suggests that institutional changes can happen in the absence of external coercive forces. Population ecology and institutional theory explain why those kinds of institutional changes can happen.

Population ecology emphasized the competitive process as a pre-eminent driver of institutional change and suggested that organizational foundings with a specific form combined with differences in survival rates among firms with different forms produce institutional change. For instance, Hannan and Freeman (1987, 1988) examined founding and mortality rates of American national labor unions in order to explain institutional evolution from craft to industrial union dominance. Here, density—the number of organizations with a specific organizational form in the population—amounts to a critical antecedent of founding and mortality rates. The initial increase of density of firms with a specific organizational form legitimizes the form over other ones, which in turn boosts

founding rates of firms with the form while diminishing their mortality rate. Beyond some threshold, additional density will augment competition within a population, with the result that founding rates decline and those firms' mortality rates go up. Though population ecology acknowledges that growing density of firms with a certain organizational form conveys more legitimacy of the form, its writers have tended to stress the effect of the legitimacy on "vital statistics" such as founding and mortality rates and have remained silent on its ramifications for organizational changes.

In contrast, institutional theory views organizational transformations and institutional processes as critical precursors of institutional change. The widespread adoption of a new organizational form will induce changes in norms, beliefs and practices such that the emergent form becomes widely accepted. Institutional writers have focused on the institutional processes that engender the growing presence of new organizational forms. Specifically, they have dealt with the role of peer organizations, nation-states and professionals (e.g., Fligstein, 1985; Scott, 1995), though among these writers various sources of legitimacy are distinguished or observed (Ruef & Scott, 1998).

Notwithstanding widely acknowledged interaction between competitive and institutional processes (e.g., Powell, 1988, 1991; Scott, 1987; Scott & Meyer, 1991), that interaction has not been explicitly articulated and researched among institutional writers. By way of distinction, we sought to combine population ecology and institutional theory in order to explain the institutional changes by focusing on the role of "*key suppliers*" and "*resource and product customers*"—which DiMaggio and Powell (1983) considered as important elements of organizational field. Though importance of these firms and individuals is recognized by "new institutionalism," their role has not been clearly articulated and empirically investigated.[1]

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[1] New institutionalism attends to organizational fields as a unit of analysis, which have been defined as "those organizations that, in the aggregate, constitute a recognized area of institutional life: *key suppliers, resource and product customers*, regulatory agencies, and other organizations that produce similar services or products" (DiMaggio & Powell, 1983; 148). [emphasis added]. Though several institutional scholars such as Meyer and Scott (1983) and DiMaggio and Powell (1983) have recognized the significance of

Market, which comprises *suppliers, customers*, and competitors, functions as a contesting arena for competing organizational forms (Nelson & Winter, 1982). When the market favors firms with a certain organizational form over others, the market feedback furnishes a clue about how private sector firms should be structured. Market as a selection environment significantly influences population level evolution (Hannan & Freeman, 1989), which in turn has a profound impact on the firm level choice of structural innovations (Miner, 1994). Figure 3 illustrates processes of institutional changes, which are not imposed by regulatory agencies. The very first adopters, who shifted from the P to the PA form, might have been influenced by developments of accounting firms in other countries or in other sectors—for example law. Or the innovation might have been a chance event, or response to cope with changes in relative prices of inputs (Leblebici, Salancik, Copay, & King, 1991; North, 1990). Given that some firms initially adopted the PA-form, we need a theory of institutional change from a P-form dominating industry to PA-form dominating one.

**Insert Figure 3 about Here**

The initial adoption of the PA-form creates population level variation. In other words, there exist P-firms as well as PA-firms. The variation might trigger selection pressures and to the extent that the environment does favor PA-form adopters—for example by superior performance, higher survival and growth rates, etc., we should observe an increasingly higher market share of adopters relative to non-adopters. In other words, the market for competing organizational forms provides feedback about its preference of the PA-form. Line number 1 in Figure 3 indicates this *competitive process*.

The market feedback—outcome of population level selection—shapes the views of managers, consultants and writers regarding the superiority of the PA-form and will thus produce a fertile ground for cognitive change. A structural template that the market

powerful suppliers and customers in the institutional process, they have ignored the role of small suppliers and customers.

for competing organizational forms reinforces positively by providing more resources to adopters over not-adopters becomes "taken-for-granted" and gains a rule-like status. As the form becomes widely accepted, it stands a much higher chance of becoming adopted by peer firms. Line number 2 in Figure 3 indicates the direct effect of market feedback on the adoption decision.

Firms imitate peers that are part of their network (Davis, 1991; Palmer, Jennings, & Zhou, 1993), or peers that have similar attributes such as similar-sized firms and geographically proximate firms (Haunschild & Miner, 1997; Haveman, 1993; Strang & Meyer, 1993). Such filters include networks, size similarity and geographic proximity (Benjamin & Podolny, 1999; Greve, 2000). Line number 3 in Figure 3 indicates these contextual conditions that produce high spillover levels. Additionally, such mechanisms amplify the effect of market feedback on firm level decision not only because that feedback is more likely to be filtered when it travels through channels from donor to recipient organizations but also because the cognitive and network filters help firms make sense of ambiguous market signals. Institutional change is contingent on the sources and paths of influence and sense making. Line number 4 in Figure 3 indicates the effect of the interaction between market feedback and firm level filters on firm level adoption. We considered the direct effect of market feedback and its indirect effect through firm level filters as *institutional process*.

Internal firm characteristics such as firm size also influence the adoption of PA-form when firms reorganize in pursuit of superior efficiency such as the reduction of internal coordination cost. Line number 5 in Figure 3 indicates this effect. Finally such institutionally driven mimicry produces variations that furnish a platform for subsequent negative selection and institutional developments. Line number 6 in Figure 3 indicates the effect of adoption decision on population level variation. Framing of the institutional change in this fashion produces an integration of population ecology, institutional and

inter-firm learning theory and leads the way to a fresh perspective on why organizations converge towards a structural standard.

The figure suggests that it is very hard for an organizational form to gain legitimacy and law-like status when market or population level selection does not favor the form or powerful actors do not coerce organizations to adopt it. Figure 3, however, is an ideal-type-like display of complex institutional changes to illustrate the interaction of the competitive and institutional process in the absence of coercive isomorphism. In reality, the creation of firms with certain forms and associated differential survival and growth rates—population level selection—affects population level variation. The population level variation such as the percentage of adopters also directly influences the adoption propensity. Besides market feedback and firm level filters, other institutional factors influence adoption behavior. Extant studies on the diffusion of organizational practices extensively explored the effect of population level variation (e.g., Davis, 1991; Palmer et al., 1993), firm level filters (e.g., Haunschild, 1993; Greve, 2000) and internal firm characteristics (e.g., Davis & Greve, 1997). While controlling for those effects and the direct effect of firm level filters on the adoption decision, this paper focuses on effects of market feedback and its interaction with firm level filters on the adoption of PA-form.

### Industry Level Selection

*Market Feedback*    Managers recognize what others are doing and how the market responds to their actions—the outcome of market selection. The market as a selection environment provides feedback about these actions by discriminating firms that are sub-standard. The feedback is informative to managers especially when the market favors firms with certain attributes; in the present case, the market is conceived as a contesting arena for competing organizational forms (Nelson & Winter, 1982).

Firms tend to adopt a template when the market for competing organizational forms favors extant adopters of the template over non-adopters. Such mimicry has been

widely documented. Firm reaction to the market feedback has been illustrated by the imitation of the Toyota Manufacturing System among American and European automobile manufacturers (Pil & MacDuffie, 1996; Womack, Jones, & Roos, 1990). Despite abundant examples of vicarious learning at the firm level and its relevance to mimetic isomorphism (Haunschild & Miner, 1997; Haveman, 1993), vicarious learning or inter-firm knowledge transfer is not explicitly incorporated in institutional theory. We suggest that market feedback favoring structural innovators conditions the cognitive premises of managers and other decision-makers through either direct exposure or through the influence of consultants and other trendsetters.

First, the market feedback renders decision-makers to believe that the adoption of the template enhances organizational performance. When very distinctive and visible templates emerge among organizations in an organizational field, firms will search for market responses to those elements. Market reactions favoring innovative organizations lead people to attribute organizational performance to the innovation and to regard its adoption as legitimate and taken-for-granted (Alchian, 1950; Fligstein, 1991). Such attribution and cognition increase the likelihood of imitation. However, firms adopt the template simply because earlier adopters are successful – not necessarily because they have any concrete, unequivocal evidence that the template would be economically efficient for them (Stearns & Allan, 1996).

Second, idea trendsetters such as academics, writers, consultants, and management gurus exploit the positive market response to innovation adopters to create shared knowledge and belief systems, which new institutionalism has emphasized (Berger & Luckmann, 1967; Meyer, 1994; Meyer & Rowan, 1977; Scott, 1995). Professionals as external consultants or internal experts might play an important role in trend-setting and legitimizing new templates (Abrahamson, 1997; Abrahamson & Fairchild, 1999). Though institutional writers recognize professionals as a key agent of social change (e.g., Meyer, 1994; Scott, 1995), they have been relatively silent about

where they get the idea of what is appropriate and what is not. Peddlers of management fads, including Peters and Waterman (1982), Hammer and Champy (1993), and Senge (1990) are replete with such implicit and explicit feedback from the market regarding innovation. Managers and other members of the corporate world read those books and are taught or consulted by those professionals. In sum, professionals use information gleaned from market feedback to create a rhetoric justifying and rationalizing the use of the template that receives positive market feedback. Through various media, professionals change the cognitive premises of managers such that they come to believe in the benefits of the template. However, it is more likely to be a rational myth than truth.

Either survival or growth rates indicate market feedback. We choose to consider these two proxies of success because of the limitations imposed on the nature of our study, which extends over one hundred years. We do not know whether growth or survival is more informative or serves to better signal the advantage of a PA-form. Growth could also confound the effect of firm size, which we consider a major inducement of innovation.

> **Hypothesis 1a.** *The strength of market feedback on firms' survival favoring PA-firms is positively associated with the adoption of a PA-form.*

> **Hypothesis 1b.** *The strength of market feedback on firms' growth favoring PA-firms is positively associated with the adoption of a PA-form.*

### Conditional Influences

The argument so far assumes that firms are equally exposed to developments and trends in the market. Both the industrial organization and early institutional literature presume such exposure to exist at the industry or population levels. Recently, several studies suggested that competitive pressures (e.g., Baum & Mezias, 1992; Formbrun & Zajac, 1987; Podolny, 1993) and interorganizational imitations (e.g., Greve, 2000; Han, 1994) are localized on the basis of firm size, physical location, reputation, and cognitive

identity. We can borrow their line of thinking and treat firm specific conditions such as social or geographic setting of organizations as rendering institutional processes channeled rather than diluted. Spillovers are conditional upon such contextual factors. As firms are selectively exposed to other firms and their members, behaviors of the select other firms are imitated and used as an anchor in interpreting environments. The implication is that we need to expand our institutional theory to include firm specific sources and paths of influence.

Foremost, firms are typically embedded in social networks (Granovetter, 1985). The institutional pressures that surface in a market travel more readily through contacts among firms, that are somehow bound together through social contacts (Hansen, 1999; Haunschild, 1993). Organizations also interact with one another symbolically. Cognitive categorization theory suggests that firms group other firms on the basis of such attributes as market segment, size, location, labor, and so on and that firms often consider other firms with similar attributes as a reference group (e.g., Alpert & Whetten, 1985; Porac & Thomas, 1990; Reger, 1987; Walton, 1986). Firms not only imitate the behaviors of their referent others (Strang & Meyer, 1993), but also interpret ambiguous environmental information such as market feedback on the basis of those behaviors (Porac & Thomas, 1990). Among possible attributes that firms use in their cognitive categorization process, the current study focuses on size similarity and geographical proximity. We extend our framework of institutional change by stipulating that the effect of market feedback on innovation adoption is conditional upon these three firm-specific factors.

*Network Embeddedness.* Let us first review extensively the interaction hypotheses involving networks. Market feedback does not exert identical influence on all organizations in an organizational field. Rather, organizations linked to innovation adopters are more susceptible to the information, since social networks function both as an information conduit and as channels that embody conformity pressure (Coleman, Katz,

& Menzel, 1966; Mizruchi, 1993). Likewise, network embeddedness exerts greater impact on adoption decisions, as negative selection information gains in strength. In short, networks act as major spillover mechanism.

First, firms that harbor newly acquired structural arrangements are bound to have members who might share their experiences with other individuals. They stand to transfer market feedback and their experience to people with whom they interact, especially with those they have embedded ties—contacts based on trust and mutuality (Levitt & March, 1988; Rogers, 1995). When firms are linked through such personally mediated ties, they are more likely to be the recipient of market information and are bound to give more weight to such information (cf. Fligstein, 1991; Haunschild & Beckman, 1998; March, 1994). In other words, information transfer among linked firms strengthens the effect of market feedback on innovation adoption. If social networks function as information conduits in this manner, what matters is *the total number* of innovation adopters with which a focal organization is linked. As the number of relevant contacts increases exposure to market feedback, the number will moderate the effect of market feedback on PA-form adoption.

Second, social networks also influence people in organizations, as individuals in their external networks reveal opinions about appropriate managerial and organizational templates and express salient expectations regarding their compliance (March, 1994). Organizations tied to innovation adopters are more likely to receive conformity pressure, which is created on the basis of market signals favoring innovation adopters. If social networks deliver conformity pressure in this manner, the *proportion* of adopters among firms with which a focal firm has contact is salient (Strang & Tuma, 1993). Using the sheer *number* of adopters in a focal firm's network as an indication of normative influence is inappropriate, since it is assumed that the focal firm is influenced only by adopters in its network, not by non-adopters. If each and every firm in a focal firm's network expresses some normative expectation, it is rather obvious that adopters signal adoption of a novel

template, while non-adopters signal the opposite. As the positive market feedback favoring adopters becomes stronger, the proportion of adopters within a focal firm's network will exert stronger influence on the focal firm's adoption decision. It is because the adopters express higher confidence in the form and exert stronger conformity pressures. This reasoning leads to the following hypotheses.

> **Hypothesis 2a**. *Market feedback and the total number of direct ties that a focal firm has with adopting organizations will have a positive interaction effect on the adoption of a PA-form*

> **Hypothesis 2b**. *Market feedback and the proportion of adopters among other firms with which a focal firm has a network tie will have a positive interaction effect on the adoption of a PA-form.*

*Size Similarity* Market feedback about a structural template is more salient if it originates from similar kinds of firms. Such firms would fit the notion of reference groups. The concept has been advanced in the psychological literature and in identity theory (e.g., Burke & Reitzes, 1981; Foote, 1951; Stryker, 1968) to describe three functions: a normative function in which individuals rely on norms to evaluate behavior and performance, a cognitive function in which individuals make sense of their world on the basis of what others sharing identity are doing, and a comparative function to furnish a benchmark for making comparative evaluations. The notion could be extended to firms (compare Fiegenbaum & Thomas, 1995; Haveman, 1993; Peteraf & Shanley, 1997).

Because field environments are complex, with heterogeneous firms and a variety of organizational niches, managers sort other firms into groups on the basis of salient traits that differentiate one group from another (Peteraf & Shanley, 1997; Porac & Thomas, 1990). This cognitive categorization allows managers to cope with environmental complexity and uncertainty by restricting their attention to limited neighborhoods of action (Levinthal & March, 1993). As organizations with similar size are likely to compete for the same type of clientele, face similar governance,

globalization and expansion challenges and recruit comparable junior professionals (e.g., Baum & Mezias 1992), firms are likely to partition other firms on the basis of size and consider other similar-sized firms as a reference group (Walton, 1986).

Because firms scan and make sense of their environment on the basis of the behaviors of their reference group (Porac & Thomas, 1990), behaviors of similar-sized firms can function as a lever that moderates the effect of market feedback on a focal firm's adoption decision. Even when market has positively rewarded innovation adopters in the past, a focal firm may not perceive the innovation as beneficial or may not recognize the market signals, if similar-sized firms have not adopted the innovation yet. In contrast, a firm is likely to be more susceptible to the market feedback when more similar-sized firms have already adopted the innovation. Such behaviors of similar-sized firms function as an anchor when firms seek to interpret market responses to specific innovations. The percentage of adopters among similar-sized firms can summarize the average behavioral pattern of the reference group. This reasoning provides following hypothesis.

*Hypothesis 3*. *Market feedback and the percentage of PA-form adopters among firms having a size similar to that of the focal firm will have a positive interaction effect on the focal firm's adoption of a PA-form.*

*Locational Proximity.*　　Another important criterion that firms use in categorizing other firms is locational proximity (e.g., Porac, Thomas, & Baden-Fuller, 1989; Reger, 1987; Walton, 1986). Professional service firms that are geographically proximate are likely to have the same type of clientele and are more like to interact with one another both directly and symbolically. Firms are likely to scan and interpret their environment on the basis of the behaviors of peers who are in their immediate vicinity (compare Jaffe, Trajtenberg, & Henderson, 1993; Podolny & Shepard, 1996). As those regionally neighbouring firms are windows through which a focal firm makes sense of

environments, it shows greater sensitivity to market feedback when a higher percentage of its proximate firms already adopted a specific form. In other words, the percentage of adopters among co-located firms moderates the effect of market feedback on adoption decisions. This reasoning leads to the following hypothesis.

*Hypothesis 4*.  *Market feedback and the percentage of PA-form adopters among firms that are geographically proximate with the focal firm will have a positive interaction effect on the focal firm's adoption of a PA-form.*

## METHODS

### Data Collection

The data of this study cover the entire population of Dutch accounting firms during the period 1880-1990. As the PA-form was first introduced in 1925, however, the study used firms that supply the data set from that time. In assessing age of firm, we used earlier years for those which were in existence prior to 1925. Firm level data were extracted from membership directories of accounting associations. Members could be flagged as owners and non-owners. Full details about data collection procedures are provided in Pennings, Lee, and van Witteloostuijn (1998).

We collected the individual level data at one to five year intervals, depending on the availability of directories. Individual level data include the name, address, educational attainments, and status (partner or associate) of each accountant in a firm. Also included is the employment affiliation, i.e., name of accounting firm, business firm, or governmental agency. We aggregated the individual level data to produce firm level information, which in turn was aggregated to create population level information.

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**Dependent Variable**

We identified the *adoption* of a PA-form by investigating the status of accountants in the firm. If a firm had at least one associate accountant for the first time in its history, we flagged the adoption of a PA-form.

**Predictor Variables**

1. *Market Feedback* Two indicators were developed as proxies for *market feedback*. The first is the differential survival rate (*MSSURVIV*) and the second the differential growth rate (*MSGROWTH*). We employed two measures to produce a more robust test of the hypotheses, particularly when doubt exists that the differential growth rate confounds the imitation and size argument.

When calculating the measures, we compounded the survival rate or average growth rate of each observation period of each group, i.e., PA-firms and non-PA-firms, from 1925 to the year under consideration.[2] *MSSURVIV* is the compounded survival rate of PA-firms divided by that of non-PA-firms, and *MSGROWTH* is the compounded growth rate of PA-firms divided by that of non-PA-firms. These indicate the degree of survival or growth rate that PA-firms enjoyed over non-PA-firms until the year under consideration. Formally,

$$MSSURVIV_t = \prod_{i=1}^{t} SRPA_i / \prod_{i=1}^{t} SRNONPA_i, \text{-------} (1)$$

where *i* and *t* are time, $SRPA_i$ is the survival rate of PA-firms during the period of time *i-1* and *i*, and $SRNONPA_i$ is that of non-PA-firms.

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[2] The underlying assumption of the market feedback measures is that all information in the past equally contributes to the strength of market feedback. An alternative assumption is that recent market selection outcomes provide more valuable information on the advantage of a PA-form than do older ones. Since we did not have an a priori rationale on how many years we should consider or how much weight we should assign to each year, we tested 60 specifications for this possibility from one year to 60 years. Sensitivity analysis using various time lag specifications shows that specifications of a lag exceeding 18 years brought about the same general pattern of results reported here. Independent of the measurement of market feedback, the other variables related to hypotheses had significant and predicted effect on the PA adoption.

$$MSGROWTH_t = \prod_{i=1}^{t} GRPA_i \Big/ \prod_{i=1}^{t} GRNONPA_i, \text{----- (2)}$$

$$\text{where } GRPA_i = \sum_{PA} Size_{k,i} \Big/ \sum_{PA} Size_{k,i-1} \text{ , and}$$

$$GRNONPA_i = \sum_{NONPA} Size_{k,i} \Big/ \sum_{NONPA} Size_{k,i-1}.$$

$GRPA_i$ is the average growth rate weighted by the size of PA-firms during time $i$-$1$ to $i$ and $GRNONPA_i$ is that of non-PA-firms. $Size_k$ is size of firm $k$ measured by the number of accountants who were affiliated with firm $k$. In calculating survival rates and growth rates, we excluded firms that changed their organizational structures in a corresponding period.

2. *Social Networks.* We measured *the exposure to adoption norm* by tracing the careers of accountants. One important way in which accountants develop social networks is by changing their organizational affiliations. When two accountants have an affiliation with a firm during any overlapping period, they are assumed to have network ties with each other thereafter. We counted the number of ties ($NTIES_{n,t}$) that accountant $n$ had at time $t$ with accountants in other firms. Among the ties, we also counted the number of accountants who were working for PA-firms at time $t$ ($PATIES_{n,t}$). For each accountant, we divided *PATIES* by *NTIES* to create exposure to the adoption norm at time $t$. By aggregating individual exposure to the firm level, we developed a proxy for firm level exposure to adoption norm. Formally,

$$EXPOSURE\ TO\ ADOPTION\ NORM_{k,t} = \sum_{n=1}^{Size_{k,t}} [PATIES_{n,t} / NTIES_{n,t}],$$

where $n$ is an accountant and $Size_{k,t}$ is the number of accountants of firm $k$ at time $t$. Two implications should be noted regarding this measurement. First, we did not consider indirect network ties, not only because direct ties are considered as more important channels through which normative information travels and conformity pressures are activated than indirect ties (cf. Palmer et al., 1993), but also because considering indirect ties complicates the measures. Second, any accountant outside a

particular firm can contribute more than one tie to the index. For example, if accountant *C* had network ties with *A* and *B* who were at a particular firm at time *t*, *C* contributed two ties to the firm at time *t*. This is also plausible for inferring the presence of conformity pressures.

We measured *the total ties to adopters* by counting the number of ties that accountants at a specific firm have with accountants in PA-firms. It is the summation of $PATIES_{n,t}$ – which is used for measuring exposure to adoption norm – over all accountants at the specific firm.

3. *Percentage of Adopters among Similar-sized Firms.* We defined size similarity in terms of the ratio: Size of other office/size of focal office. Firm size was measured by its number of accountants. All values that fell within the range of .5 to 2.0 comprised a size cohort. The cohort was then used to determine which percentage of similar-sized firms had a PA-form. We tested other ranges such as 1/3 to 3, 1/4 to 4, etc. The range of .5 to 2.0 provided the best goodness of fit.

4. *Percentage of Adopters among Geographically Proximate Firms.* We measured the variable by the percentage of PA-form adopters in the province that a focal firm had the largest number of offices for the corresponding observation period. We tried other geographic classifications of the Dutch territory including the four largest Dutch cities vs. other regions and west, south, north versus east. The province specification provided the best goodness of fit.

**Control Variables**

We controlled for *the percentage of PA-firms*, which is measured by the number of PA-firms divided by the number of all firms in the population (Fligstein, 1985; Palmer et al., 1993), since the variable can indicate institutionalization of PA-form and thus enhance adoption rate of a PA-form.

We controlled for the following firm characteristics: organizational size, age, the number of offices, location and previous organizational changes. We measured *organizational size* by counting the number of accountants who were affiliated with the firm. Size indicates not only the scale and complexity of the organization but also its visibility to external constituencies and, thus, susceptibility to the institutional environment (Dobbin, Edelman, Meyer, Scott, & Swidler, 1988; Edelman, 1990). Larger firms are likely to have stronger motives to create a more efficient governance structure and to endure stronger institutional pressure.

*Organizational age* was measured by years elapsed after founding. Age has been considered as a key antecedent of organizational change, as age, indicating increased inertia, may have a negative effect on the adoption of the PA-form (Hannan & Freeman, 1984). We controlled the *number of domestic offices*, and the number of establishments in the four largest Dutch cities (Amsterdam, Rotterdam, Utrecht, and The Hague).

Also controlled were the *cumulative number of acquisitions, splits, and name changes* a firm experienced. If organizations have a proclivity toward organizational change, the number of prior changes may be positively associated with their propensity to adopt the PA-form. When two or more firms joined together, the event was coded as an *acquisition*. When the resulting firm adopted one of the pre-existing names, the event was coded as an acquisition without name change. The firm that maintained its name was coded as an acquirer, whereas the others were treated as acquired firms. When two or more firms joined together and adopted a new name, the event was coded as an acquisition with name change. Continuation of the firm was assigned to the largest of the involved firms and other smaller counterparts were treated as acquired firms. When the size of the involved firms was equal, the new firm was labeled as the continuation of the firm whose name came first in the alphabet.

*Organizational splits* were coded when at least two partners left and formed a new firm. *Name changes* were coded when the name of a firm differed from its previous

one, provided two-thirds or more of its partners continued their affiliation with the firm. The name changes did not include mutations due to acquisition or "cosmetic" name changes, such as modifications in the order of named partners. Neither did we treat the addition of the Dutch equivalents of "Accountants" or "Registered" and "Limited Liability" to the original as a name change.

Descriptions of the history of the Dutch accounting industry (Zeff, Van der Wel, & Camfferman, 1992) provided important historical changes that may affect adoption rates. We controlled for proxies of "history," including World War II, Indonesian independence in 1949, and significant changes in regulations that governed the accounting profession and its clients. The effects of World War II and Indonesia's independence are short-lived in this context. World War II was specified as having effects during the period 1941-1947, and the independence of Indonesia during the period 1949-1951.

The industry experienced two significant regulatory changes. The Act on Annual Financial Statements of Enterprises was approved in 1970 and took effect in 1971. It required annual audits for the first time and increased the amount of financial information to be reported by companies (Zeff et al., 1992). From 1984 onwards, definitive guidelines for auditing were promulgated and enforced by the "NIvRA" (the exclusive professional association) in collaboration with the Justice Ministry (Zeff et al., 1992). By increasing the complexity of accounting procedures and specifying the companies that should be externally audited, the regulations significantly heightened the demand for audit services. As such, they could be seen to increase the demand for large accounting firms and perhaps to influence adoption propensity. Because the regulations were still effective in 1990, they were specified as governing the entire period following the onset of the regulations.

We also controlled for the length of observation intervals. As mentioned before, the data have non-uniform observation intervals from one to five years. Since the odds

of PA adoption may be positively related with the length of the observation interval, we included the natural logarithm of the length of the observation interval (measured in years). We also estimated models with four dummies for each interval length. The results were not substantially different from what we have reported here.

**Model and Estimation**

Empirical analysis of this study deals with time-varying conditions that lead up to the adoption of a PA-form. Firms that dissolved or were acquired by other firms before adopting a PA-form were treated as right-censored. Firms that were alive in 1990, but did not adopt the innovation, were also right-censored. Having adopted the PA-form, a firm was removed from the data set since it was no longer a candidate for such mimetic adoption. In the event history analysis, we included all P-firms and sole proprietorships, since they were at risk of adopting PA-form. Most firms changed their form from the P-form or sole proprietorship to the PA-form by hiring new associate accountants rather than by reclassifying some existing partners to associates. Single proprietorships were at risk of adopting the PA-form, since they also could hire new associate accountants and thus adopt the PA-form. In other words, single proprietorship at time $t$ can become a PA-firm at time $t+d$ by hiring associate accountants during the period $d$. In fact, our data indicated that 96 single proprietorships adopted the PA-form by hiring new associates.

Since our data involves time aggregation and right censoring, the estimates from continuous event history analysis are at best biased (Petersen, 1991; Petersen & Koput, 1992). Following Allison's (1982) recommendation, we employed discrete event history analysis. A discrete-time hazard rate is defined by:

$$P_{it} = \Pr\,[T_i = t \mid T_i \geq t,\, X_{it}],$$

where $T$ is the discrete random variable giving the uncensored time of adoption. $P_{it}$ is the conditional probability that firm $i$ will adopt a PA-form at time $t$, given that it has not already adopted it.

Specifically, we used the complementary log-log function that provides a consistent estimate of the continuous-time, proportional hazards parameters regardless of the interval length or the size of failure rate (Allison, 1982; Petersen & Koput, 1992). Our research setting satisfied two conditions for adequately using the complementary log-log function (Petersen & Koput, 1992). First, censoring always occurs at the end of the interval. Second, there is only one state at which adoption can take place. The model is expressed as:

$$P_{it} = 1 - exp\,[\,-\,exp(\alpha_t + X_{it}\,\beta)],$$

or

$$log\,[\,-\,log\,(1\,-\,P_{it})] = \alpha_t + X_{it}\,\beta,$$

where $\alpha_t$ is a function of time, $X_{it}$ is a row vector of the firm $i$'s state variable at time $t$, and $\beta$ is a column vector of coefficients. In estimating the model, we specify

$$\alpha_t = \alpha_0 + \alpha_1 log\,(d) + \alpha_2\,log(\text{organizational age}),$$

where $d$ is the length of observation interval.

All independent variables were lagged by one observation period. In other words, population level variables and firm $i$'s state variables at time $t$ were used as independent variables to explain the adoption during time $t$ and $t+d$. Thus, we included firms with a single accountant in the risk set. A procedure with complementary log-log function in SAS (Allison, 1995) was used to estimate the models.

## RESULTS

Figure 4 illustrates average growth rates of P-firms and PA-firms weighted by their firm size for each observation interval. PA-firms enjoyed higher growth rates than P-firms in every observation interval except for 1982-1986. Figure 5 shows survival rates of P-firms and PA-firms for each observation interval. PA-firms enjoyed higher survival rates than P-firms in every observation internal. Both figures suggest that population level

selection has favored PA-form over P-form over a long period of time. It is very likely that the strong market feedback triggered an institutional isomorphic process.

**Insert Figure 4 about Here**

**Insert Figure 5 about Here**

Table 1 lists the means, standard deviations, and the correlation matrix of the variables that were used in this study. These statistics were based on 961 firms (4456 firm-intervals). Among the statistical findings, a very high correlation between differential growth rate and differential survival rate was observed. Among 301 adopters, 4 firms were omitted from this study because they adopted the structure in 1925. An additional 24 firms were deleted because they were already organized with a PA-structure in the very first year of their observed existence. We could not create firm-level factors because information was lacking as to whether these firms were actually founded as PA-firms, or whether they were founded without a PA-form and adopted it before they were first observed in the data matrix. The remaining number of adopters in this study was 273.

**Insert Table 1 about Here**

Table 2 presents the results from a regression analysis based on a complementary log-log specification. First, the first two models show the analysis when differential growth rate and differential survival rate are inserted separately in each model. A very high correlation (0.95) between market feedback measures, i.e., the growth and survival rate, suggests that the results were not sensitive to the choice of measures. Since model 1 provided a slightly better goodness of fit, we use that model as our baseline model. Models 1 and 2 show the effect of two market feedback indicators while controlling for other variables. In model 3, 4, and 5, we added interaction terms to show their explanatory power for testing hypothesis 2a, 2b, 3, and 4. We included all interaction terms in model 6. The chi-square tests at the bottom of Table 2 show that the addition of interaction terms, either individually or collectively, significantly improved the goodness of fit.

The coefficients for market feedback support Hypotheses 1a and 1b in all models: The strength of market feedback slanted towards PA-firms was positively associated with adoption propensity. These results indicated that organizational decision-makers are more likely to adopt a PA-form when the market and their customers send a strong signal by shifting their demand to adopters.

Results of model 1 and 2 indicate that all firm level filters significantly enhance adoption propensity. Firms of which accountants had more network ties to adopters and exposed to stronger adoption norm adopted the PA-form more frequently. The percentage of adopters among similar-sized firms, and the percentage of adopters among physically proximate peer firms induce adoption propensity.

The interactions between market feedback and the total number of ties to adopters were also positive and statistically significant for model 3 and 6. Although the incremental chi-square at the bottom of model 3 was significant at $p < .10$, it became significant at the 5% level when the second interaction term from model 3 was omitted. The results supported Hypothesis 2a. However the interactions between market feedback and exposure to adoption norm were not statistically significant. The results did not support Hypothesis 2b.

The interaction between market feedback and the percentage of adopters among similar-sized firms had positive and statistically significant effects on a PA-form adoption in model 4 and 6. The incremental chi-square test as shown at the bottom of model 4, which compares model 4 with model 1, suggested that the addition of this term significantly improved the goodness of fit. The results provided therefore strong support for Hypothesis 3.

The interaction term between market feedback and the percentage of adopters among geographically proximate firms also had positive and statistically significant coefficients in model 5 and 6. Incremental chi-square test at the bottom of model 5,

which compares model 4 with model 1, suggested that the addition of the interaction term significantly improved the goodness of fit. The results provided strong support for Hypothesis 4.

Besides firm level filters, several control variables had statistically significant effects on PA-form adoption. The percentage of PA-firms in the industry had positive and statistically significant effect on the adoption propensity. In all models, the coefficients of organizational size were positive and statistically significant. The natural logarithm of organizational age had a negative and significant coefficient. This indicates that younger firms are more likely to adopt PA-forms. Among four proxies of prior organizational change, the number of previous name changes was the only variable that was significantly associated with PA-form adoption. The positive coefficient indicates that the number of previous name changes was positively related with PA-form adoption. The number of offices in four largest Dutch cities was also positively related with PA-form adoption in all models. Other control variables did not have a consistent effect on the adoption across models.

## DISCUSSION AND CONCLUSIONS

To explain institutional changes, the present paper proposed a framework that combined population ecology and institutional theory by using the concept of market feedback. By analyzing the evolution of the Dutch accounting industry, we showed that population level or market level selection has favored PA-form over P-form over a long period of time. This paper investigated the direct effect of the market feedback and its interaction with firm level filters on the adoption of PA-form, while controlling for internal firm characteristics, population level variations, and main effects of firm level filters. First, we proposed that the market feedback in favor of the new organizational form would positively influence adoption decision. This prediction was strongly supported by our findings. Second, we hypothesized that social networks, size similarity

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and physical co-location would interact with market feedback in producing higher adoption levels. This prediction was also strongly supported by our findings.

The implications of the research presented here are broad. First, we investigated a very important but largely neglected mechanism in institutional change—market feedback. That concept enabled us to more meaningfully integrate population ecology and institutional theory for uncovering institutional changes. The results of this study imply that information from population level selection constitutes an important legitimizing force of an organizational form and leads professionals into creating a rationalized myth. The legitimacy enhanced by positive market feedback in turn stimulates diffusion. Population ecologists (Hannan & Freeman, 1984) have argued that the environment maximizes its ecological rationality by selecting out those firms possessing an ecologically superior form. They have later contended that diminished mortality conveys enhanced legitimacy (e.g., Hannan, Carroll, Dundon, & Torres, 1995), but the primacy for institutional changes resides in the environment, not in the strategic choices of managers. The present study, however, shows that both competitive process at the population level and adaptive adoption at the firm level contributed to institutional change as  the domminat form evolves from the P-form to the PA-form. More importantly, this study suggests that competitive processes at the population level trigger institutional processes, which in turn change population level variation. Indeed the observed  "structural" spillovers in our study suggest that the population will be transformed in a way that cannot be captured by the notion of negative selection.

This study invites a new dialogue between institutional theory and population ecology by integrating the two research streams to better capture institutional change. The dialogue so far centers on the issue as to whether the density of organizations with an organizational form indicates its legitimacy (e.g., Baum & Powell, 1995; Carroll & Hannan, 1989; Zucker, 1989) or whether the adoption of legitimized forms enhances survival chances (e.g., Singh, Tucker, & House, 1986). Our study suggests that summary

information of market selection in prior time periods conveys legitimacy of organizational forms and thus influences adoption decision by managers.

Second, we incorporated firm level filters at the firm-environment interface. While most of previous studies about diffusion filters have investigated their main effect on innovation adoption, we explored their interaction with market feedback on firm level adoption while controlling for the main effects. The migration of professionals among firms leads to a form of ongoing embeddedness (Granovetter, 1985), in which ensuing network ties function as a route for information transfers and as a normative context for organizational actions. The present study showed that social ties with innovators strengthen the influence of market feedback on adoption. Similar interpretations can be advanced for the role of size similarity and geographical proximity. Because similar-sized firms and geographically proximate firms provide windows through which a focal firm interprets population level selection, that firm is more susceptible to market feedback when a higher percentage of its "reference group" had already adopted the PA-form. While size similarity and physical proximity are drivers of inter-firm networking and are often linked to networking, we isolated them as a driver of symbolic interactions and documented their main and interactive affects with market feedback over and beyond those of social ties.

Parenthetically, the institutionalization observed in this industry reveals a strong size contingency. The accounting industry is characterized by a duality in that we find a bimodal size distribution. As we have shown, size figures prominently in our results regarding structural innovation. In 1990 more than 4/5th of the sector was without a PA structure, arguably because they are small (mostly single proprietorships), quite distinct from the rest of the sector, and so impervious to the market selection effects experienced by their larger counterparts. Presumably this duality in size also explains the contingent nature of institutionalization as revealed by Figure 2 regarding the market share vs.

proportion of firms measure. While the market share grows, the number of PA-firms remains flat from 1937 onwards.

Weaknesses in this study provide several suggestions for future research. First, we investigated the diffusion of a PA-form within the Dutch accounting sector. However, as so many network studies, we face the "boundary specification problem" (Laumann, Marsden, & Prensky, 1989), since institutional processes can operate across borders and industries. For instance, Dutch accounting firms can be influenced by how foreign accounting firms and other kinds of domestic professional firms such as law and consulting partnerships were structured. The present study could not investigate the institutional processes across national and sectoral boundaries due to data limitation. Future research could explore such higher level processes, especially in this age of technological and market convergence.

Second, we suggested that professionals are likely to exploit market feedback in legitimizing new social arrangements. Due to lack of relevant data, we could not directly test this assumption. Future research might explore whether the level of positive rhetoric around structural innovations is positively associated with the strength of market feedback favoring innovative firms. For instance, content analysis conducted by Abrahamson (1997) and Abrahamson and Fairchild (1999) could be integrated with market feedback information. More generally, future research should investigate what kinds of logic or data professionals are leveraging in justifying new organizational practices.

Third, we assumed that all social contacts are equally influential in disseminating innovation-related information and conformity pressure. An incumbent is influenced by a number of contacts in his environment—"alters" in the network lingo. A focal firm is more susceptible to external influence coming from a connected alter when the connected alter is similar or is located in the same geographical area. The present study made significant contributions to a firm's innovative receptivity as a function of its network. We partitioned the effects on imitation by uncovering the effects that are due to networks,

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versus those that are due to size similarity and physical proximity. However, we need to include significant other effects as well—for example strategic similarity and absorptive capacity. We did not use such data because they are hard to come by. However, future research could explore these research questions by using spatial heterogeneous diffusion models suggested by Greve (2000) and Strang and Tuma (1995).

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## Figure 1. Number of PA-form Adopters and Survivors



## Figure 2. Market Share and Proportion of PA-firms

Figure 4 Growth Rate of P-firms and PA-firms



Figure 5. Survival Rate of P-firms and PA-firms

# Figure 3. Processes of Institutional Changes

**Table 1. Means, Standard Deviations, and Correlations among Variables***

| Variables | Means | S. D. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. PA Adoption | 0.06 | 0.24 | | | | | | | | | | | | | | | | | | | | |
| 2. Market Feedback (Differential Growth Rate) | 7.84 | 6.67 | 0.07 | | | | | | | | | | | | | | | | | | | |
| 3. Market Feedback (Differential Survival Rate) | 8.13 | 4.44 | 0.08 | 0.95 | | | | | | | | | | | | | | | | | | |
| 4. Total Number of Ties to Adopters/100 | 0.18 | 0.36 | 0.08 | -0.11 | -0.16 | | | | | | | | | | | | | | | | | |
| 5. Exposure to Adoption Norm | 0.26 | 0.43 | 0.12 | 0.19 | 0.19 | 0.04 | | | | | | | | | | | | | | | | |
| 6. % Similar-sized Firms | 0.08 | 0.12 | 0.29 | 0.04 | 0.06 | 0.15 | 0.16 | | | | | | | | | | | | | | | |
| 7. % Geographically Proximate Firms | 0.17 | 0.10 | 0.03 | 0.05 | 0.15 | 0.03 | -0.02 | 0.13 | | | | | | | | | | | | | | |
| 8. Percentage of PA firms | 0.18 | 0.05 | 0.03 | 0.11 | 0.32 | 0.00 | -0.15 | 0.12 | 0.47 | | | | | | | | | | | | | |
| 9. Organizational Size | 1.50 | 5.80 | 0.14 | 0.05 | 0.05 | 0.03 | 0.12 | 0.32 | 0.04 | -0.01 | | | | | | | | | | | | |
| 10. Ln (Organizational Age) | 1.72 | 1.12 | -0.03 | -0.05 | -0.06 | 0.17 | 0.04 | 0.10 | 0.09 | 0.07 | -0.01 | | | | | | | | | | | |
| 11. No. of Acquisitions with Name Change | 0.03 | 0.30 | 0.03 | 0.03 | 0.04 | 0.03 | 0.06 | 0.24 | 0.03 | 0.00 | 0.07 | 0.09 | | | | | | | | | | |
| 12. No. of Acquisitions without Name Change | 0.06 | 0.42 | 0.06 | -0.03 | -0.03 | 0.06 | 0.12 | 0.18 | 0.02 | 0.00 | 0.06 | 0.25 | 0.06 | | | | | | | | | |
| 13. No. of Splits | 0.01 | 0.12 | 0.02 | 0.00 | -0.01 | 0.01 | 0.05 | 0.13 | 0.00 | -0.01 | 0.02 | 0.12 | -0.01 | 0.42 | | | | | | | | |
| 14. No. of Name Changes | 0.09 | 0.31 | 0.09 | 0.00 | 0.01 | 0.18 | 0.10 | 0.19 | 0.04 | 0.02 | 0.04 | 0.26 | 0.05 | 0.17 | 0.13 | | | | | | | |
| 15. No. of Domestic Offices | 1.32 | 1.18 | 0.19 | 0.11 | 0.10 | 0.07 | 0.16 | 0.42 | 0.13 | 0.00 | 0.50 | 0.01 | 0.19 | 0.07 | 0.02 | 0.12 | | | | | | |
| 16. No. of Offices in Four Largest Dutch Cities | 0.54 | 0.58 | 0.08 | -0.28 | -0.28 | 0.10 | 0.00 | 0.19 | 0.70 | -0.07 | 0.14 | 0.06 | 0.05 | 0.04 | 0.02 | 0.08 | 0.30 | | | | | |
| 17. World War II (1 if 1940<Year<1946) | 0.02 | 0.14 | 0.00 | -0.12 | -0.15 | 0.04 | 0.00 | 0.00 | -0.01 | -0.04 | 0.00 | 0.05 | -0.01 | 0.00 | -0.01 | 0.02 | -0.01 | 0.04 | | | | |
| 18. Indonesia's Independence (1 if 1948<Year<1952) | 0.06 | 0.23 | 0.01 | -0.19 | -0.17 | -0.05 | -0.04 | 0.04 | -0.02 | -0.08 | 0.00 | -0.12 | -0.01 | 0.04 | 0.03 | 0.00 | 0.01 | 0.10 | -0.03 | | | |
| 19. Regulation of 1971-1973 (1 if Year>1971) | 0.25 | 0.44 | 0.05 | 0.87 | 0.76 | -0.07 | 0.17 | 0.04 | 0.00 | 0.01 | 0.04 | -0.01 | 0.02 | -0.03 | 0.00 | -0.01 | 0.09 | -0.22 | -0.08 | -0.14 | | |
| 20. Regulation of 1984-1989 (1 if Year>1984) | 0.05 | 0.22 | 0.07 | 0.56 | 0.55 | -0.04 | 0.09 | -0.02 | -0.04 | -0.03 | 0.06 | -0.09 | -0.02 | -0.01 | -0.01 | 0.00 | 0.06 | -0.14 | -0.03 | -0.06 | 0.40 | |
| 21. Ln (Length of Observation Interval) | 0.62 | 0.49 | 0.06 | 0.39 | 0.33 | -0.01 | 0.07 | 0.03 | 0.03 | 0.06 | 0.03 | -0.01 | -0.05 | -0.01 | -0.01 | 0.02 | 0.04 | -0.07 | 0.28 | -0.22 | 0.36 | 0.36 |

*Based on 4,456 Firm - Intervals

**Table 2. Regression Analyses of PA Adoption (4,456 firm-intervals: 273 adopters)**

| Variables | Model 1 | Model 2 | Model 3 |
|---|---|---|---|
| Intercept | -4.820*** | -4.811*** | -4.934*** |
|  | ( .397) | ( .399) | ( .403) |
| Market Feedback (Differential Growth Rate) | .064*** |  | .067*** |
|  | ( .025) |  | ( .026) |
| Market Feedback (Differential Survival Rate) |  | .078** |  |
|  |  | ( .031) |  |
| Differential Growth Rate* Total Number of Ties to Adopters/100 |  |  | .026** |
|  |  |  | ( .013) |
| Differential Growth Rate* Exposure to Adoption Norm |  |  | -.012 |
|  |  |  | ( .022) |
| Differential Growth Rate* % Similar-sized Firms |  |  |  |
|  |  |  |  |
| Differential Growth Rate* % Geographically Proximate Firms |  |  |  |
|  |  |  |  |
| Total Number of Ties to Adopters/100 | .116*** | .114*** | .648*** |
|  | ( .044) | ( .044) | ( .251) |
| Exposure to Adoption Norm | .612*** | .624*** | .665*** |
|  | ( .154) | ( .154) | ( .245) |
| % Similar-sized Firms | 1.940*** | 1.942*** | 1.896*** |
|  | ( .715) | ( .715) | ( .619) |
| % Geographically Proximate Firms | 2.149* | 2.147* | 2.237* |
|  | (1.227) | (1.228) | (1.206) |
| Percentage of PA Firms | 7.080*** | 5.821*** | 7.782*** |
|  | (2.021) | (2.036) | (2.035) |
| Organizational Size | .249*** | .245** | .281*** |
|  | ( .096) | ( .096) | ( .086) |
| Ln (Organizational Age) | -.251*** | -.249*** | -.263*** |
|  | ( .059) | ( .059) | ( .060) |
| No. of Acquisitions with Name Change | -.172 | -.172 | -.142 |
|  | ( .187) | ( .187) | ( .186) |
| No. of Acquisitions without Name Change | .189 | .185 | .201 |
|  | ( .129) | ( .130) | ( .130) |
| No. of Splits | -.181 | -.155 | -.150 |
|  | ( .352) | ( .349) | ( .349) |
| No. of Name Changes | .372*** | .365** | .380*** |
|  | ( .144) | ( .145) | ( .145) |
| No. of Domestic Offices | .033 | .036 | .031 |
|  | ( .043) | ( .043) | ( .045) |
| No. of Offices in Four Largest Dutch Cities | .323* | .324* | .347** |
|  | ( .173) | ( .174) | ( .168) |
| World War II (1 if 1940<Year<1946) | .307 | .348 | .424 |
|  | ( .463) | ( .467) | ( .464) |
| Indonesia's Independence (1 if 1948<Year<1952) | .423* | .398 | .413 |
|  | ( .254) | ( .253) | ( .256) |
| Regulation of 1971-1973 (1 if Year>1971) | -.530* | -.273 | -.460 |
|  | ( .321) | ( .248) | ( .320) |
| Regulation of 1984-1989 (1 if Year>1984) | .308 | .317 | .232 |
|  | ( .283) | ( .283) | ( .287) |
| Ln (Length of Observation Interval) | .178 | .203 | .104 |
|  | ( .160) | ( .159) | ( .161) |
| Log-Likelihood | -935.6 | -935.7 | -932.9 |
| Degrees of Freedom | 19 | 19 | 21 |
| chi-square test comparing with Model 1 (d.f.) |  |  | 5.4 (2)* |

Note: *: $p < .10$; **: $p < .05$; ***: $p < .01$ (Two-tailed test); Standard errors in parentheses under parameter.

*(Table 2 Continued)*

| Variables | Model 4 | Model 5 | Model 6 |
|---|---|---|---|
| Intercept | -4.804*** | -4.891*** | -4.960*** |
|  | ( .395) | ( .407) | ( .409) |
| Market Feedback (Differential Growth Rate) | .060** | .079*** | .079*** |
|  | ( .025) | ( .030) | ( .030) |
| Market Feedback (Differential Survival Rate) |  |  |  |
| Differential Growth Rate* Total Number of Ties to Adopters/100 |  |  | .021** |
|  |  |  | ( .010) |
| Differential Growth Rate* Exposure to Adoption Norm |  |  | -.014 |
|  |  |  | ( .022) |
| Differential Growth Rate* % Similar-sized Firms | .034*** |  | .036** |
|  | ( .011) |  | ( .015) |
| Differential Growth Rate* % Geographically Proximate Firms |  | .095*** | .107*** |
|  |  | ( .030) | ( .037) |
| Total Number of Ties to Adopters/100 | .118*** | .116*** | .600** |
|  | ( .045) | ( .044) | ( .265) |
| Exposure to Adoption Norm | .621*** | .617*** | .694*** |
|  | ( .154) | ( .154) | ( .249) |
| % Similar-sized Firms | 1.644** | 1.934*** | 1.643** |
|  | ( .803) | ( .713) | ( .671) |
| % Geographically Proximate Firms | 2.412* | 1.151 | 1.513 |
|  | (1.250) | (1.641) | (1.617) |
| Percentage of PA Firms | 7.259*** | 6.520*** | 7.275*** |
|  | (2.018) | (2.136) | (2.142) |
| Organizational Size | .253*** | .250*** | .266*** |
|  | ( .097) | ( .095) | ( .091) |
| Ln (Organizational Age) | -.241*** | -.250*** | -.250*** |
|  | ( .060) | ( .059) | ( .060) |
| No. of Acquisitions with Name Change | -.178 | -.172 | -.155 |
|  | ( .187) | ( .185) | ( .186) |
| No. of Acquisitions without Name Change | .193 | .185 | .199 |
|  | ( .130) | ( .130) | ( .130) |
| No. of Splits | -.181 | -.176 | -.124 |
|  | ( .357) | ( .349) | ( .347) |
| No. of Name Changes | .356** | .360** | .336** |
|  | ( .144) | ( .145) | ( .147) |
| No. of Domestic Offices | .026 | .038 | .029 |
|  | ( .044) | ( .043) | ( .046) |
| No. of Offices in Four Largest Dutch Cities | .360** | .313* | .394** |
|  | ( .176) | ( .174) | ( .172) |
| World War II (1 if 1940<Year<1946) | .300 | .280 | .380 |
|  | ( .462) | ( .465) | ( .464) |
| Indonesia's Independence (1 if 1948<Year<1952) | .428* | .416 | .403 |
|  | ( .254) | ( .254) | ( .256) |
| Regulation of 1971-1973 (1 if Year>1971) | -.550* | -.519 | -.469 |
|  | ( .323) | ( .321) | ( .322) |
| Regulation of 1984-1989 (1 if Year>1984) | .338 | .281 | .258 |
|  | ( .286) | ( .286) | ( .295) |
| Ln (Length of Observation Interval) | .183 | .187 | .121 |
|  | ( .160) | ( .160) | ( .162) |
| Log-Likelihood | -932.0 | -932.1 | -927.3 |
| Degrees of Freedom | 20 | 20 | 23 |
| chi-square test comparing with Model 1 (d.f.) | 7.2 (1)*** | 7.0 (1)*** | 16.6 (4)*** |

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