경영학 석사학위논문

The Interplay of Experiential and Social Learning Mechanisms in Firm Exit Decisions

조직 퇴출 의사결정에서의 경험 학습과 사회적 학습 영향에 관한 연구

2016 년 2 월

서울대학교 대학원
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이 논문을 경영학 석사 학위논문으로 제출함

서울대학교 대학원

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안연신의 석사 학위논문을 인준함

2016년 2월

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ABSTRACT

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This study examines how organizations' private information obtained from performance feedback is moderated by social learning mechanisms. Building on inferential learning and market categorization literatures, my theory suggests that even when organizations experience multiple performance failures, they are not likely to exit the market when a substantial number of peers have entered the industry. On the contrary, they are more likely to exit the market when a relatively large number of peers have exited. The latter relationship is weakened when the average number of industries with which exiting peers engage is greater. This is because decision makers regard the exits of those who are involved in diverse categories as involuntary actions rather than signaling a negative market situation, and they rely less on such signals. I test my theory using longitudinal data on the exit decisions of 1,405 U.S. private venture capital firms from 1987 to 2014.

Keywords: performance aspiration, market category, organizational learning

Student Number: 2014-20453

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INTRODUCTION

A number of organization theory and strategic management studies have sought to explain the robust finding that organizations often do not exit the market even when they show poor firm performance. Indeed, mounting empirical evidence suggests that performance is not necessarily a factor that determines firm exit (Blau 1984; Carroll and Huo 1986; Meyer and Zucker 1989; Kalleberg and Leicht 1991; Levinthal 1991). Such real world examples seem to contradict what population ecology theory commonly predicts. Population ecology theory proposes that organizations within the same niche compete for limited resources, and those who lag behind display poor performance and are doomed to exit the niche (Hannan and Freeman 1977, 1984; Baum and Mezias 1992). Furthermore, Penrose (1952: 810) summarized this theoretical view by stating that "positive profits can be treated as the criterion of natural selection—the firms that make profits are selected or 'adopted' by the environment, and others are rejected and disappear."

Two questions can be raised to reconcile the apparently conflicting empirical findings regarding poor performance and firm exit: (a) What is “poor performance”? That is, what are the common criteria for firms to decide whether their performance is bad?, and (b) What are the factors that inhibit firms to exit the market even when they display poor performance?

The rationale for the first question is that each organization may have different yardsticks for gauging performance, so that what seems to an outsider to be poor performance is not necessarily perceived as that "poor" by the organization itself. If this is the case, the reason that firms with seemingly poor performances are not exiting the market is simply because their performance is not really perceived that poor. Performance feedback theory sheds light on this issue. The main tenet of performance feedback theory is that firms assess their performance in relative terms (as a function of aspiration), rather than in terms of absolute outcomes. According to students of performance feedback theory, organizations commonly have two standards for evaluating their performance: historical aspiration and social aspiration (Cyert and March 1963; Greve 2003). The former standard stems from the fact that organizations desire to evolve, so they strive to perform better than in the past. The latter derives from organizations' desire to evaluate their relative status and make improvements based on such an evaluation (Wood 1989; Greve 2003). In light of such desire, studies have proposed that organizations set the average performance of the meaningful reference group as a social aspiration, and endeavor to exceed the aspiration (e.g., Kim, Haleblian, and Finkelstein 2011; Mezias, Chen, and Murphy 2002).

Meanwhile, human resource management literature speaks to the issue of the second question. Studies suggest that organizations displaying

poor performance do not exit the market because of their managers' human capital characteristics (Gimeno, Folta, Cooper, and Woo 1997). Specifically, organizations are not likely to exit even when they exhibit poor firm performance when managers do not see enough turnover opportunities in the labor market or when they are motivated by non-economic goals such as deriving satisfaction from doing a certain type of work which they like (Smith and Miner 1983; Lafuente and Salas 1989). Seen from this perspective, although organizations may be performing poorly and the decision makers of those organizations may acknowledge this, they may decide not to exit the market for reasons unrelated to performance. While this literature has significantly advanced our understanding of why firms showing poor performance do not exit the market by demonstrating that exit is a decision problem of managers, important gaps in our understanding of this phenomenon remain. Especially noteworthy is that there has been little consideration of how peer firms' actions may contribute to organizations' decision to remain in the market even when displaying weak performance.

Research on organization theory has shown that organizations are embedded in the environment (Granovetter 1985), so their strategic decisions are inevitably influenced by peers' actions (White 1988, p. 238). This phenomenon is termed the "social learning" of organizations (Belderbos, Olffen, and Zou 2011), and three types in particular of such social learning

exist (Watts 2003, pp.207-215; Kim, Park, and Bae 2015). First, organizations are "following the crowd" to enhance their legitimacy (DiMaggio and Powell 1983) or avoid sanctions costs incurred by showing illegitimate behavior (Scott 1995). Such a phenomenon is often labeled as mimetic isomorphism in neo-institutional literature. Mimetic isomorphism is an "a-rational mimicry" process (Lounsbury 2008) that views isomorphism as a result of firms' unconditional imitation of one another when they face uncertainty. Organizations imitate peers because other organizations' behaviors represent safer alternatives that are easier to justify in the case of adverse outcomes (DiMaggio and Powell 1983; Haunschild and Miner 1997; Greve 1998). Second, organizations follow others' actions so as to take advantage of network externalities (Easley and Kleinberg 2010, p.453). Since organizations in this case benefit when both parties choose the same option, they try to coordinate their behaviors in order to maximize their own profits. Thus, such a mechanism is the most rationality-based type of social learning, as firms' anticipated future benefits are considered when making decisions. Third, organizations make inferences based on observing peers' actions (Miner and Haunschild 1995; Terlaak and Gong 2008; Gaba and Terlaak 2013; Greve and Taylor 2000). The key idea for such an observational learning mechanism is that "actions reflect information" (Bikchandani, Hirshleifer, and Welch 1998, p.154).

The following predictions of firm exit could be derived from each social learning mechanism. First, in the neo-institutional perspective, organizations do not want to be singled out from the population, as they are reluctant to be punished for deviant behaviors. For instance, if a single firm displays poor economic performance and cannot help but downsize, its downsizing behavior is likely to draw much attention and institutional pressure. Upsurges of layoffs and hiring freezes may create a negative image of the firm to stakeholders. When many other firms commit the same deviant act, however, it is less likely that any individual firm will be singled out for criticism (Ahmadjian and Robinson 2001). That is, as more firms downsize across the population, the social costs of downsizing for any single firm are likely to decrease. Thus, organizations' decisions to downsize when showing poor performance are triggered by the majority of peers' downsizings. However, it is noteworthy that downsizing is different from firm exit, as the former is associated with going concerns (Davis, Diekmann, and Tinsley 1994). That is, in the neo-institutional perspective, an organization follows its high status peers or majority of peers in order to avoid sanction costs so that it can successfully remain in the market. Therefore, this perspective is more appropriate when explaining market segment exit (Dobrev 2007; Greve 1995; Henisz and Delios 2004), or practice abandonment (Ahmadjian and Robinson 2001; Gaba and Dokko 2015) than firm exit (Gaba and Terlaak 2013).

Furthermore, in the network externalities view, coordination between a focal organization and its peers is crucial to benefit all parties. In such a case, if firm A is exiting the market, the benefits drawn from network externalities decrease, which prompts firm B, which is a peer of firm A, to exit. Lastly, in the information externalities perspective, a focal organization observes its peers' actions and interprets such actions as a pessimistic signal for future market conditions. This inference stems from the fact that a focal firm regards its peers as having valuable information about the market that it does not have (Gaba and Terlaak 2013; Terlaak and Gong 2008).

For all the long history of research on organizations' social learning mechanisms, the literature on management and sociology has been silent on the role of each organization's prior experience, while overly emphasizing the role of a social signal on an organization's strategic decision-making processes. However, since a focal firm's private experience as well as social signal simultaneously affects its decision-making processes (Gaba and Dokko 2015), our understanding of such processes is limited if we do not consider the interplay of these two factors. Hence, the essence of this study lies in bridging two disconnected areas of the literature, performance feedback theory and inferential learning (Greve 2013), in the context of firm exit. Thus, the primary purpose of this study is to achieve in-depth understanding of the firm exit phenomenon by investigating how organizations' private

information earned from performance feedback is moderated by the social learning mechanism. Since my study frames firm exit as a decision problem following many other prominent studies (Gaba and Terlaak 2013; Gimeno et al. 1997), and investigates the interplay between two major signals—private and social signals—affecting such decision-making processes, I emphasize the information externalities perspective among the three social learning mechanisms.

My study raises the following questions in particular: What is the role of peers' exit and entry on a focal firm's exit decision? How do firms take advantage of private information and social information simultaneously? What is the extent of the influence of peers' actions? Drawing from inferential learning and market categorization literatures, my theory suggests that organizations evaluate whether it is worthwhile to remain in the industry mostly on the basis of performance feedback, and that peers' actions have a subtle yet notable impact on the firm's exit decision. In particular, my theory proposes that even when organizations experience multiple failures, they are not likely to exit when a substantial number of peers have entered the industry. On the contrary, they are more likely to exit the industry when a relatively large number of peers have exited. The latter relationship is weakened when the average number of industries with which exiting peers engage is greater. This is because decision makers are likely to regard the

exits of those who are involved in diverse categories as involuntary actions, rather than as signaling a negative market situation, and thus rely less on such signals. I test my theory using longitudinal data on the exit decisions of 1,405 U.S. private venture capital firms from 1987 to 2014.

This paper is arranged in four sections. First, I introduce the venture capital industry, and explain how this industry is appropriate to test my theory. In the next section, I review prior research on firm exit and hypothesize about the interplay between a private and a social signal on firm exit decision. I then present the results of an in-depth longitudinal study on U.S. private venture capital firms to assess how their decisions to exit unfolded based on peers' characteristics and actions. I conclude with a discussion and implications for research.

RESEARCH SETTING

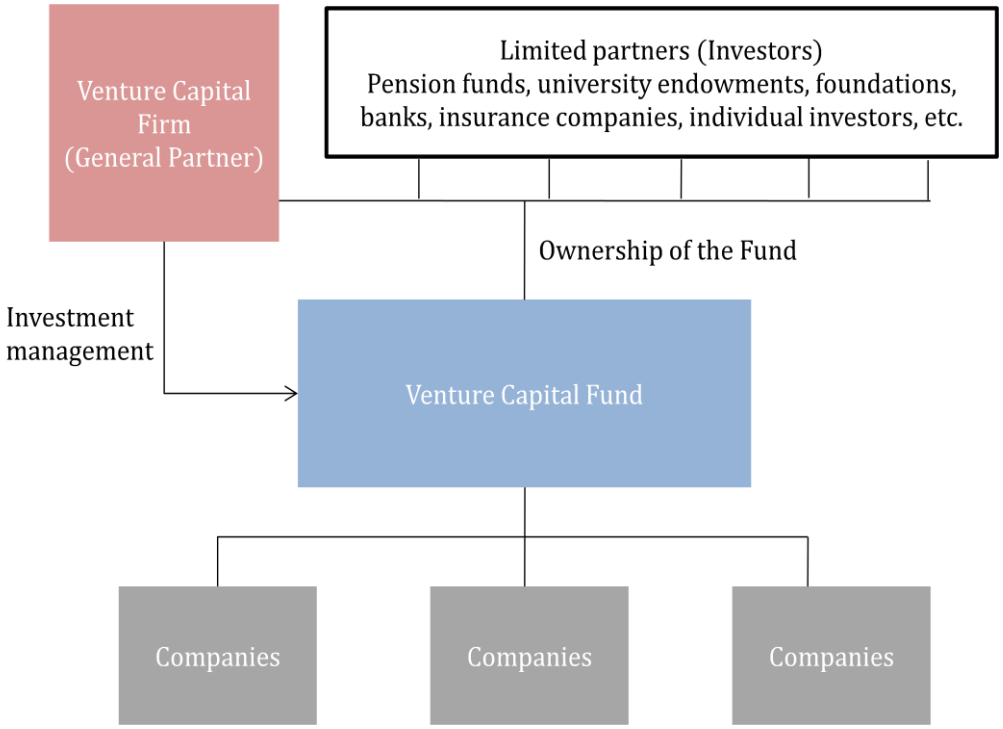
Ecology of the Venture Capital industry

Venture Capital (VC) firms in the United States are mostly structured as limited liability companies, whose managers are known as managing members. VC firms raise capital from investors for the purposes of making equity investments in private companies. Capital is raised periodically in the form of a fund that is structured such that the VC firms are general partners and the fund's investors are limited partners. Limited partners generally consist of institutional investors, such as pension funds, university endowments, foundations, banks, insurance companies, and individual investors. Fundraising takes place when limited partners commit a certain amount of capital to a general partnership's fund. Once a substantial portion of a fund's committed capital has been invested in portfolio companies, VC firms usually raise a subsequent fund for future investment purposes, usually every 3 to 5 years. When VC firms decide to exit, the first thing they do is to stop raising a subsequent fund. However, it is noteworthy that VC firms that decide to exit do not disappear immediately (Rider and Swaminathan 2011), because funds typically have fixed life spans of 7 to 10 years, and VC firms need to wait until the funds that they currently manage expire. Any funds that are raised but not yet invested are normally returned to investors.

Venture capitalists attend industry events, consider entrepreneurs'

funding requests, speak with other investors to learn opportunities, conduct due diligence on prospective investments, seek co-investors, and satisfy the concerns of potential limited partners. Among others, accurately evaluating the prospects of start-up companies is the key to the good performance of VC firms, as well as to determining when companies should go public (Gompers and Lerner 2004). Precise evaluations and optimal IPO timing rely heavily on the skills of VC firms (Sorenson 2007). All such roles of venture capitalists require a high level of audience engagement—media, institutions that evaluate VC firms, as well as private companies, investors, competing VCs—as they need to get valuable information from them, to find investors, and to find partners with which they can raise and manage funds. In all, private VC firms largely enter into relations with three sets of exchange partners—private companies, investors, and competing private VCs. In this study, I will focus primarily on the relationship between a focal VC firm and its competitors, although it is not possible to consider this relation in complete isolation from the others.

Figure 1. Structure of the Venture Capital Industry



Firm Exit in the VC Industry

This study frames firm exit as a decision problem following many other prominent studies (e.g., Gaba and Terlaak 2013; Gimeno et al. 1997), and investigates the interplay between two major signals—private and social signals—that affect such decision-making processes in the context of U.S. private VC firm exit from 1987 to 2014. The VC industry is an excellent empirical setting in which to test hypotheses for several reasons. First, examining firm exit decisions through observational learning requires a research context in which firms are susceptible to social influence as well as a situation in which a firm exit is a decision problem. VC firms typically have a few general partners, and the field interviews from a prior study (Gaba and Terlaak 2013) indicate that VC firm "exits are often active decisions shaped by a confluence of factors that include firm performance, market outlooks, outside options, and lifestyle considerations." Furthermore, anecdotal evidence from a prior study (Gaba and Terlaak 2013) corroborates the existence of social learning mechanism in the VC industry. One interviewee mentions that "this is a very insecure, incestuous, and promiscuous business. So there is always a sense of 'did I miss something?'" Another says that "with these years of downturn, you start wondering what to do, and you look to others to see how they are responding: Are they downsizing, are they leaving?"

Second, to examine the exit and entry of firms, the research setting should be an industry with relatively flexible exit and entry variations. Industries that require high-fixed costs as a result of maintaining massive equipment have high entry and exit barriers, which preclude the existence of variations in exit and entry among firms. For example, the contexts of hotels (Baum and Mezias 1992), breweries (Carroll and Swaminathan 1991), and knitwear manufacturers (Porac, Thomas, and Baden-Fuller 1989) all have high entry and exit barriers which are inadequate to evaluate the effect of observational learning on a firm exit decision. By contrast, the private VC industry meets the condition of low entry and exit barriers perfectly, given that private VC firms do not hold capital or physical assets. Instead, they rely on limited partners to commit a specific amount of capital to their fund.

THEORY AND HYPOTHESES

Firm Exit

Firm exit has mostly been examined by students of population ecology theory. They take up the position of open-system theories of organization (Thompson 1967; Sorenson 1999), so little attention has been paid to the role of each firm's decision makers. Rather, they have been mostly interested in the environmental conditions of an organization's destiny, which is either to survive or to perish. Students of population ecology theory argue that the high density of organizations within a certain niche decreases the viable amount of resources per organization (Hannan and Freeman 1977; Carroll and Hannan 2000), intensifying the competition amongst organizations, engendering poor performance for those that lag behind, and catalyzing firm exits (Baum and Mezias 1992). Following the logic of population ecology theory, as more firms exit, the competition in a given niche becomes somewhat reduced because more resources are freed up. This hospitable environment makes further exit unattractive. Thus, peer organizations' prior exits decrease the risk of a focal firm's exit (Dobrev 2007; Baum and Oliver 1992).

On top of the fundamental resource-release effect of the population ecological perspective, scholars have extended such a perspective by bridging it with institutional theory and social network theory. For instance, Baum and

Oliver (1991) propose that linkages to government and community institutions that have been either socially accepted or have legislative authority reduce an organization's mortality rate with the intensity of competition. Furthermore, Cattani and colleagues suggest that film producer organizations' exit rate is reduced when they have a high degree of connectivity with distributors as higher connectivity reduces ambiguity about organizational action and fosters consensus on the norms that are taken for granted (Cattani, Ferriani, Negro, and Perretti 2008).

In all, firm exit has been studied by population ecology theorists for a long time, and our understanding of firm exit has been expanded thanks to their incorporation of institutional theory and social network theory. However, our comprehension of the firm exit phenomenon has still restricted as firm exit has been framed only as failure or a display of a firm's mortality, which is triggered because firms fail to be taken for granted by external audiences or lag behind their peers owing to severe competition (e.g., Rider and Swaminatham 2011).

It was only recently that scholars began to question the framing of firm exit as firm failure. They propose that firm exit can be seen as a decision problem (e.g, Gaba and Terlaak 2013; Gimeno et al. 1997). Firms may decide to exit if they think they are not likely to be successful in the future. Several studies argue that the prior exits of peer firms trigger further exit (e.g., Greve

and Seidel 2015; Gaba and Terlaak 2013; Greve 2011), as peer firms' prior exits provide information with which to predict the future of the industry. In particular, a number of prior exits signal to a focal firm that the industry's outlook is rather gloomy, which influences its own decision on exit (Strang and Macy 2001; Still and Strang 2009). Furthermore, some studies even propose that a prior exit deters further entry (Greve and Seidel 2015; Terlaak and Gong 2008).

In following the stream of recent studies, I begin by conceptualizing firm exit as a decision problem. That is, based on past and current performance data combined with expected future market conditions (Dixit and Pindyck 1994; Murto and Valimaki 2011; Greve 1995; Gaba and Terlaak, 2013; Gaba and Dokko 2015), decision makers determine whether to persist or disband their firms.

Performance Aspirations and Firm Exit

Studies commonly predict that organizations that are not competing well against their competitors are likely to exit because they receive negative feedback from the market, resulting in poor firm performance. Although scholars have proposed that poor performance increases the likelihood of firm exit, strangely, they have stayed silent about what poor economic performance is. This is because firm exit has mostly been studied from the

population ecological perspective (e.g., Baum and Mezias 1992; Baum and Oliver 1991; Ingram and Inman 1996), and these researchers' interests have tended to lean toward the density of a given niche as the determinant of a firm's mortality. Poor economic performance is no more than a notion of lagging behind to the scholars with ecological perspectives.

However, if firm exit is a decision problem as a few recent studies suggest (Gimeno et al. 1998; Gaba and Terlaak 2013), it is important to understand when decision makers actually perceive their firm performance to be poor, as their firm exit decision will be based on such a perception. Behavioral theory of the firm (Cyert and March 1963) helps us to understand this issue. According to Cyert and March (1963), an organization, a coalition of groups involved in multiple competing goals inevitably faces disagreements when making decisions and undergoes lengthy bargaining processes. When conflicts are somewhat resolved, stakeholders reach a quasi-resolution by agreeing upon two aspiration levels— historical aspiration and social aspiration. The former standard stems from the fact that organizations strive to evolve, so that they hanker to perform better than in the past. The latter derives from organizations' desire to evaluate their relative status and make improvements based on such an evaluation (Wood 1989; Greve 2003). In light of such desire, studies have proposed that organizations set the average performance of the meaningful reference group as a social aspiration,

and endeavor to exceed the aspiration (e.g., Kim, Haleblian, and Finkelstein 2011; Mezias, Chen, and Murphy 2002). That is, aspiration levels serve as yardsticks by which decision makers judge whether their firm performance is poor.

With a few exceptions (e.g., Ben-Oz and Greve 2012; Greve 2002), studies of organizations' feedback strategies mostly focus on how organizations react according to short-term feedback on their performance. Organizations actively change their behaviors based on two such standards. When their performance level is below the aspiration level set by the performance of others or their own past performance, they endeavor to change their market position (Greve 1998), growth rate (Greve 2008), pace of new product launches (Giachetti and Lampel 2010), and strategic orientation (Audia, Locke, and Smith 2000; Lant, Milliken, and Batra 1992). Organizations also engage in mergers and acquisitions (Haleblian, Kim, and Rajagopalan 2006). Conversely, it is argued, organizations maintain current practices when their performance is above their aspiration levels.

Meanwhile, the primary purpose of my study is not to investigate organizations' adaptive mechanism based on short-term performance feedback, but to examine their exit decision, which should be based on their reaction to long-term feedback. By following studies on behavioral theory of the firm (Cyert and March 1963), I propose that decision makers regard firm

performance that is below aspiration levels—historical aspiration and social aspiration—as a failure. Granted that exit is the most radical decision that a firm can make, I assume that a focal firm's cumulative number of failures rather than a single failure has a positive relationship with the firm exit likelihood.

Proposition. A focal firm's cumulative number of failures has a positive relationship with the firm exit likelihood.

Inferential Strategy and Firm Exit

Although negative performance feedback is the major information source that influences a firm's exit decision, a significant number of firms remain in the market even if they experience failures, which indicates there are other factors that affect their decision to exit.

Based on the assumption that decision makers are responsible for an organization's behavior, I use the terms "organizations" and "decision makers" interchangeably in this study. Decision makers who decide an organization's behavior are boundedly rational (Simon, 1965; March and Simon 1958). Their private information obtained from prior experience is limited by the inherently confined scope of their experience, and by constraints on their information processing capacity. Therefore, to offset such limitations, decision makers pay attention to the information revealed by predecessors. In

other words, decision makers take heed of peer firms' behaviors in order to make their decisions precisely or for organizations to take advantage of a social learning mechanism.

Existing studies on an organization's social learning mechanisms can be categorized into the following three types. First, organizations show frequency-based imitation (Haunschild and Miner 1997) as they think that a majority of others have more and better information that they do not have (Banerjee 1992; Bikhchadani, Hirshleifer, and Welch 1992). Such information externalities argument assumes that perceived benefits between alternatives are determined by the choices of others. Second, organizations conform to imitate the majority of peers' actions either to achieve legitimacy (Tolbert and Zucker 1983; DiMaggio and Powell 1983; Lee and Pennings 2002), or to avoid punishment for showing deviant behaviors (Granovetter 1978; Ahmadjian and Robinson 2001). For instance, in order to survive in the environment, organizations seek to adopt legitimate practices (Meyer and Rowan 1977). Or, since some practices are so frequently in use that organizations "take for granted" such practices and adopt them rather unconsciously. Third, an organization decides to follow its peers as aligning its behaviors with others' gives a direct benefit. For example, a fax machine is of little use if no one else owns one, since the primary role of such a machine is to interact with others. The more users, the more benefits each

user reaps. So this mechanism diverges from a learning mechanism based on information externalities, as a focal firm's payoffs are directly affected by others' actions, rather than indirectly by receiving new information (Easley and Klienberg 2010, p.426).

Not every social learning mechanism mentioned above is applicable to the study of firms' exit decisions. In particular, in the conformity-based social learning perspective, an organization tends to follow the majority of its peers in order to be taken for granted by external audiences or to avoid sanction costs so that it can successfully persist in the market. Therefore, such a type of social learning mechanism is related to a firm's going concerns, so this perspective is more appropriate when explaining market segment exit (Dobrev 2007; Greve 1995; Henisz and Delios 2004), or practice abandonment (Ahmadjian and Robinson 2001; Gaba and Dokko 2015) than firm exit (Gaba and Terlaak 2013). Furthermore, there is no evidence to indicate that a private VC firm's benefit from remaining in the market is enhanced when more VC firms exist in the industry. Of course, in the nascent stage of the VC industry, it is important for the VC business model to be taken as granted by external audiences, so each VC firm counts on the others to increase the population density (Miner 1993). To preclude this legitimization mechanism, I deliberately curtailed the early years of the U.S. VC industry. I will explain this more specifically in the method section. Thus,

the network externalities-based social learning mechanism is not appropriate to explain a VC firm's exit decision making, at least in my study.

Instead, the information externalities mechanism is proper to explain the role of social learning in a VC firm's exit decision-making. I assume that decision makers determine whether to stay or exit the market based on two information sources—private information taken from performance feedback and social signals inferred from peers' actions. In particular, each firm updates its private information with information deduced from the actions of other firms. Such reasoning shares a similar theoretical perspective with the herding model, according to which, a decision maker "starts with some private information, obtains some information from its predecessors, and then decides on a particular action" (Bikhchandani et al. 1998, p.153). When decision makers regard the information inferred from others' behaviors as more powerful than their private information, and disregarding their own information, decide to join the actions of the crowd, herding or an information cascade has occurred (Easley and Klienberg 2010, p.425).

Largely three types of social signals that affect a focal firm's decision to exit—peer firms' prior exit, prior non-exit (i.e., stay), and prior entry. Of these three signals, decision makers would be the least receptive to peer firms' non-exit. This is because decision makers' attention is a scarce and valuable resource of a firm (March and Simon 1958; Simon 1965), so organizations do

not learn from all information but only from the more visible or salient information (March and Olsen 1976; March, Sproull, and Tamuz 1991; Haunschild and Miner 1997). Even though organizations take heed of peers to hone their decisions, peers' actions that have not changed are likely to go unnoticed by decision makers, and therefore organizations with limited rationality will rely less on those signals.

Meanwhile, the frequency of prior entry signals that the future condition of the market is sound enough. In contrast, a high frequency of prior exits signals that the condition of the future market looks bleak. If a focal firm has experienced a number of failures, that is, when its past performance has been below aspiration levels for many years, and when there is a high frequency of prior entry in the market, decision makers face two conflicting signals. In this case, decision makers try to make inferences from peers' behaviors. Their reliance upon their private performance information may be weakened, as they are inclined to be suspicious of their own information when others' behaviors cannot be explained by their logic. Therefore, organizations are likely to stay in the market for at least one more term, hoping that their performance improves in the future. The inference behind the imitation is that decision makers believe there is information about the quality of alternatives in the choices of other organizations (Greve 2013). Decision makers make inferences based on the belief that "common

things are good," which occurs before the point of choosing among the alternatives that enter the choice set because of their frequency.

Therefore, rather than impetuously exiting the market, decision makers will try to identify some problems from their prior experiences and then set out to improve their performance in the future. Some organizations may drop their existing practices and adopt new ones, or enter into a new market to leverage such a predicament. Even so, they are less likely to exit the market when they read some rosy prediction about the future based on social signals inferred from peers' actions. Studies indicate that organizations start a problemistic search when they experience negative performance feedback, in order to fill the gap between their performance and expectations (Singh 1986). Most studies following behavioral theory of the firm (Cyert and March 1963) suggest that performance feedback is the sole mechanism that explains a firm's problemistic search. However, I shed light on the possibility that the inferential learning mechanism also plays an important role.

In contrast, when a focal firm has experienced a number of failures, that is, its past performance fell below aspiration levels several times, and when the majority of its peers exit the market, decision makers of the focal firm accept this social signal to corroborate their decision to exit. Therefore, in such a case, the likelihood that the organization will exit increases.

Hypothesis 1a. The positive relationship between the number of a focal VC firm's failures and its exit likelihood will be weakened by the focal firm's observation of peers' prior entry into the VC industry.

Hypothesis 1b. The positive relationship between the number of a focal VC firm's failures and its exit likelihood will be strengthened by the focal firm's observation of peers' prior exit from the VC industry.

The Role of Multiple Category Membership as a Signal

When organizations decide whether to stay or exit based on peer firms' actions as well as on their cumulative number of negative performance feedback, not every peer firm exerts the same degree of influences. Studies have shown that peer firms' traits, such as status and size, matter in the context of inter-organizational learning (Haunschild and Miner 1997). In particular, early neo-institutional theorists (e.g., DiMaggio and Powell, 1983) suggested that organizations adopt the practices of legitimate peers and that legitimacy is inferred from traits like large size or high status. Regarding the organizations' trait-based imitation, reference organizations' extent of diversification can be one trait that is taken into account.

Since external audiences cannot easily observe the quality of a firm, they often rely on signals such as reputation (Jensen, Kim, and Kim 2012), status (Podolny 1993), and social ties (DiMaggio and Louch 1998) to make

inferences regarding the firm's quality. In such a light, external audiences may also rely on a firm's category boundary to identify and make sense of a firm's quality of services (Zuckerman 1999; Leung and Sharkey 2013).

Given that a firm's category boundary signals its identity and quality to audiences, it is important to understand what aspects of a firm's category boundary generate positive or negative signals. Studies of market categorization indicate that products or services that span multiple categories suffer social and economic disadvantages (Hsu, Hannan, and Kocak 2009; Hsu, Negro, and Kocak 2010, p.176). This is because such category spanners form confused identity so they receive less attention from audiences, and have difficulty gaining legitimacy. In particular, audiences tend to regard those who engage in multiple categories as having a lack of expertise in each category, as each category requires a different combination of abilities. Therefore, firms that participate in multiple categories tend to be either ignored (Zuckerman 1999), or devaluated (Polos, Hannan, and Carroll 2002; Rao, Monin, and Durand 2005) by audiences.

Furthermore, customers in each category in the market usually have different needs. Since firms participating in multiple categories cannot focus their limited efforts and resources narrowly but need to supply services to several categories with divergent needs, it is difficult for them to develop the capabilities that convey their quality to an audience (Hsu, Hannan, and

Kocak 2009). These disadvantages result in lower chances of success and survival (Dobrev, Kim, and Hannan, 2001; Zuckerman 1999).

When a VC firm engages in multiple industries by investing in companies covering diverse industries, it is likely to accord limited attention and resources to each category and hence has difficulty in offering services of consistently good quality, because each industry requires different knowledge. Furthermore, since VC firms, as general partners, raise funds from limited partners such as institutional investors, pension funds, university endowments, foundations, banks, insurance companies, and individual investors, and make investments in portfolio companies, it is important that they give a good impression to these partners, as well as to their peer VC firms, with which they manage funds together (Rider and Swaminatham 2011). In addition, when VC firms participate in diverse industries, it is difficult for them to build a strong identity and reputation for an expertise, which makes them less appealing, and their value in the market may be discounted by major audiences, notably their limited partners and peer VC firms.

These circumstances suggest that if a VC firm that has engaged in a diverse spectrum of industries makes an exit, the exit would be an involuntary exit (i.e., firm failure), resulting from social discounts imposed by external audiences, rather than a firm's autonomous decision. From the decision makers' perspective, this type of exit does not signal a negative

market situation and thus they rely less on such signals. Studies on the signaling role of a firm's category boundary usually focus on the relationship between a firm and its customers (e.g., Leung and Sharkey 2013) or between a firm and arbiters such as security analysts (Zuckerman 1999) and movie critics (Hsu, Hannan, and Kocak 2009), even though a firm's category boundary is acknowledged to have an effect on general audiences. Divergent from the existing research on market categories, this is study investigates the signaling effect of a firm's category boundary on its peers.

Hypothesis 2. The positive moderating effect of prior exit decreases as the number of industries with which the prior exit firms engages increases.

METHODS

Data and Sample

I used Thompson One (Venturexpert), provided by Thomson Reuters, as the primary data source to test the hypotheses. My sample consists of all U.S. private VC firms included in the Thomson One database from 1987 through 2014. I focused only on private VC firms and excluded other private equity sources of financing, many of which have different objectives from those of private VC firms (Gaba and Terlaak 2013). For instance, most of the incentive structures in corporate funds are structured as corporate subsidiaries and have much lower incentive-based compensation, which differ dramatically from private VC firms (Gompers and Lerner 2004, p. 127). Furthermore, although the modern VC industry emerged in 1980 (Gompers and Lerner 2001, pp. 72-73), I decided to start from 1987, because the early stage of an industry is likely to be governed more by legitimacy logic, which may overshadow the inter-organizational learning mechanism. Over the 27-year period of the study, I tracked 1,405 firms, 264 of which exited the market.

Measures

Dependent Variable.

I coded a dummy variable that takes on the values of 1 if a focal VC firm

exits at time t, and 0 prior to that date. The Thompson One database provides information on the status of each VC firm in terms of five classifications—"defunct," "inactive," "actively seeking new investments," "making few, if any, new investments," and "reducing investment activity." I coded firms classified as "defunct" or "inactive" as exits, following a previous study (Gaba and Terlaak 2013). By contrast, I coded firms classified as "actively seeking new investments" as active, and assigned a value of 0 to them. For firms classified as exits, I used their last investment years presented in the database to identify the year of exit, thus, the exit year was coded as the year following the year of the last investment, and a value of 1 was assigned to that year. Meanwhile, I classified as exits firms that were "making few, if any, new investments," or "reducing investment activity," if they made their last investments seven years before the focal year, given that most funds managed by VC firms have a life span of 7 to 10 years.

Independent Variables.

Frequency of failures*Prior entry

To test hypothesis 1a, I created the variables *Frequency of failures* and *Prior entry*.

Frequency of failures. In this study, failure is defined as a situation in which a firm's performance falls below its aspiration levels. Therefore, to operationalize the frequency of failures for each firm, the firm's performance

and its aspiration levels should to be measured. A VC firm's performance was measured by considering average time spent for its portfolio companies to exit. Two exit types were considered—IPO and acquisition, as IPO is known to give the largest return on investment to a VC firm (Gompers and Lerner 2004, p.26, p.172). Furthermore, an earlier study defined IPO and acquisition as portfolio companies' successful exits (Cumming and Johan 2008), which implies that these are the types of exit that would maximize the profit of a VC firm. Annual average time spent for portfolio companies to exit via IPO and acquisition for each VC firm was extracted from the Thompson One database.

Based on the annual performance of each firm, aspiration levels were computed. I calculated two different aspiration levels based on average time spent for its portfolio companies to exit—historical aspiration level, derived from the historical average time spent for its portfolio companies to exit of a focal firm, and the social aspiration level, derived from the average time taken (for its portfolio companies to exit) of rival firms in the industry (Greve, 1998). Rival firms, or peers, in the VC industry are defined as those that share the same investment focus among the following four types—seed, early, later, expansion with a focal firm. Next, social aspiration levels at time *t* were constructed as the simple mean of the average time taken (for its portfolio companies to exit) of every other firm. Then, a dummy variable of 1 was coded if a focal VC firm had negative performance feedback—performance

failure—at time t. Finally the variable, *Frequency of failures* was measured for each firm by cumulatively summing the number of failures from time 1 to time t. Instead of using annual negative performance feedback as most performance feedback theory studies do, I coded the frequency of such feedback, because firm exit is the most radical decision that a firm can make, and a single failure is not likely to trigger that decision. Rather, decision makers wait and observe the trends of their performance over time.

Prior entry. Prior entry denotes the number of VC firms that entered the industry at time t-1 and that share the same investment focus among the following four types—seed, early, later, expansion with a focal firm. There are no clear divisions among the definitions of each stage, so divisions should be seen as relative measures of firm development, rather than absolute measures. Usually all seed investments are made in very young companies. Early-stage investments are classified as middle rounds, because, even though the firms are still relatively young, they are further developed than seed or start-up companies. Second, third, expansion, or bridge stage funding is considered to be later stage financing (Gompers and Lerner 2004, p.183). Such classifications in the VC industry are important because average duration, amount of venture capital funding, and the rate at which the firm uses cash during that particular round are all different. For instance, the duration of financing declines for later-stage companies and the average

amount of financing per round for such companies generally rises, as VCs know more about later-stage firms and therefore are willing to invest more money for longer periods (Gompers and Lerner 2004, p. 183). I multiplied this measure by *Frequency of failures* for each firm to make an interaction term to test hypothesis 1a.

Frequency of failures*Prior exit

Prior exit. Prior exit denotes the number of VC firms that exited the industry at time t-1, and that share the same investment focus among the following four types—seed, early, later, expansion with a focal firm. I multiplied this measure by *Frequency of failures* for each firm to make an interaction term to test hypothesis 1b.

Frequency of failures*Prior exit*Avg. number of industries involved

Average number of industries involved. Among ten distinct industry categories listed in the database, the number of industries in which each firm made investments at time t was counted. The mean of the number of industries in which each firm invested at time t-1 was measured among those that shared the same investment focus among the following four types—seed, early, later, or expansion with the focal firm. This measure was then multiplied by *Frequency of failures* and *Prior exit* for each firm to make an interaction term to test hypothesis 2.

Control Variables

Age. Firm exit decisions may also be related to a firm's age in that it may demarcate a niche in the VC industry. Older VC firms tend to access different types of resources to manage (Carroll and Hannan 2000; Baum and Oliver 1991). Moreover, young VC firms have keen incentives to bring IPOs earlier to market than established VC firms, in order to build a track record and raise new capital (Gompers and Lerner 2004, p. 396). A VC firm's *Age* was taken to be the number of years since founding. I also include *Age2* to capture any nonlinear effects of firm age.

Size. Firm size was measured as the log of the total dollar amount of investments made by a VC firm at time t. Earlier research has shown that size significantly affects a firm's mortality (Carroll and Hannan 2000; Baum and Mezias 1992), and in the VC industry, size also serves as an important signal for limited partners (Bothner, Kim, and Lee 2015).

Density. Density at the industry level was controlled for. As the population ecology theory predicts, density can influence firm exits by affecting both the industry's legitimacy and competition caused by appropriating resources (Carroll and Hannan 2000). Following Gaba and Terlaak (2013), a density measure counts the number of all private equity firms, not just private venture capital firms, competing in the U.S. VC industry at time t. This measure was exponentiated in order to capture any nonlinear effects of density. Data for this measure were obtained from the *2015 National Venture*

Capital Association Yearbook.

Experience. Experience is the cumulative number of investments that a firm has made at time t. Apart from firm age, the number of companies that a firm has engaged in represents its experience, which may affect its social learning processes.

Defunct. The number of portfolio companies that became defunct in each VC firm's portfolio at time t was controlled for. This is because performance measures such as IPO and acquisition cannot capture the effect of companies that become defunct, yet such companies can be a major performance threat to a VC firm.

Public equity market. Research has found that the public equity market significantly affects VC firms' activities (Gompers, Kovner, Lerner, and Scharfsein 2008). To control for such effects, this variable measures the value-weighted annual return on the NASDAQ (including dividends). Data for this measure were obtained from *Wharton Research Data Services*.

Model Specification

The data used in analysis included annual observations over a 27-year period. To test the hypotheses, I used a maximum-likelihood logistic regression to predict the likelihood of a focal VC firm's exit decision as a function of (1) the frequency of failures, (2) number of prior exit, (3) number of prior entry,

(4) average number of industries that prior exit firms have involved, (5) and a set of control variables. STATA version 12 was used to fit the models to the data.

RESULTS

Figure 1 presents the total numbers of U.S. private VC firms' exits and entries by year. As expected, VC firms' exits and entries display significant variations, which corroborate my choice of an empirical setting to test my theory.

Figure 2. Number of Entries and Exits of VC firms (1987-2014)

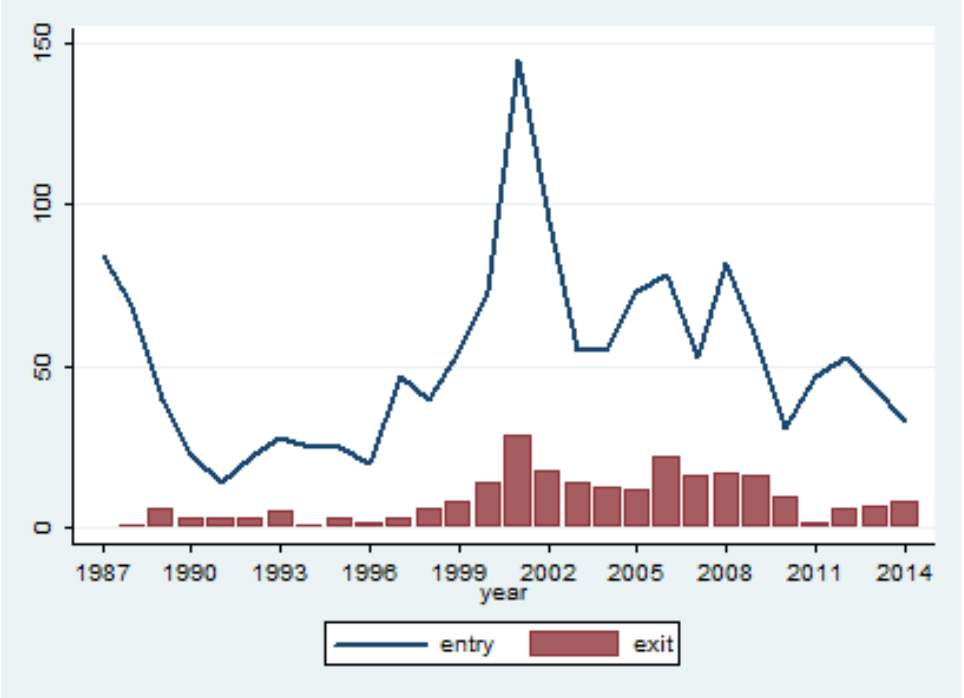


Table 1 presents descriptive statistics of the variables included in the analysis.

Table1. Descriptive Statistics and Correlations

	Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12
1	*exit (0/1)*	0.02	0.15	1											
2	*Frequency of failures*	3.47	3.74	-0.021	1										
3	*Prior entry*	38.36	29.61	0.037	-0.123	1									
4	*Prior exit*	18.44	15.4	0.023	-0.015	0.239	1								
5	*Avg. number of industries involved*	1.98	1.03	-0.014	0.142	0.047	0.288	1							
6	*Age*	15.2	10.87	-0.01	0.572	-0.017	0.017	0.089	1						
7	*Age2*	348.99	767.58	-0.013	0.359	0.002	0.017	0.048	0.879	1					
8	*Defunct*	1.04	2.42	-0.052	-0.036	0.395	0.025	-0.096	0.023	0.026	1				
9	*Size*	2.3	1.69	-0.184	0.21	0.177	0.13	0.075	0.133	0.085	0.335	1			
10	*Experience*	32.36	42.79	-0.071	0.554	0.001	0.076	0.114	0.44	0.3	0.204	0.502	1		
11	*Density*	304488.7	207441	0.031	0.032	0.507	0.212	0.094	0.023	0.012	0.061	0.195	0.061	1	
12	*Public equity market*	0.12	0.3	-0.031	0.048	0.008	-0.235	-0.061	0.036	0.016	-0.011	-0.05	0.025	0.281	1

Table 2 reports the results of the maximum-likelihood logistic regression models. In Table 2, Model 1 presents the baseline model with control variables. In Model 2, all the main variables are included. Model 3 tests hypothesis 1a. Hypothesis 1a investigates the moderating effect of prior entry on a focal firm's frequency of failures and its exit likelihood. In Model 3, such a relationship is not significant, so Hypothesis 1a is not supported. Hypothesis 1b examines the moderating effect of prior entry on a focal firm's frequency of failures and its exit likelihood. In Model 4, the effect is supported by the significant $p<0.05$. The positive relationship between the number of failures and a focal VC firm's exit will be strengthened by the focal firm's observation of prior exit from the VC industry.

Hypothesis 2 examines the three-way interaction effect. I argued that the positive moderating effect of prior firm exits decreases as the number of industries in which the prior exit firms engage increases. In Model 5, the three-way interaction term is significant ($p<0.1$) and negative. This result implies that the extent of prior exits' impact on a focal firm's exit decreases when prior exit firms engaged in multiple industries. Thus, hypothesis 2 is supported.

Table2. Effect of Effect of Hypothesized Factors on Exit Likelihood

Variable	Model 1		Model 2		Model 3		Model 4		Model 5	
Frequency of failures			0.098*	(0.035)	0.070	(0.045)	0.045	(0.048)	0.005	(0.084)
Prior entry			0.009*	(0.003)	0.008†	(0.036)				
Prior exit			0.012†	(0.005)			0.005	(0.006)	0.000	(0.030)
Avg. number of industries involved			-0.166†	(0.079)					-0.108	(0.152)
*Frequency of failures*Prior entry*					0.000	(0.000)				
*Frequency of failures*Prior exit*							0.003*	(0.001)	0.014*	(0.006)
*Prior exit*Avg. number of industries involved*									0.018	(0.038)
*Frequency of failures*Avg number of industries involved*									0.003	(0.013)
*Frequency of failures*Prior exit*Avg number of industries involved*									-0.005†	(0.003)
Age	0.089**	(0.028)	0.062*	(0.028)	0.063*	(0.028)	0.077*	(0.030)	0.071*	(0.029)
Age2	-0.001*	(0.000)	-0.001†	(0.001)	-0.001*	(0.001)	-0.001*	(0.006)	-0.001*	(0.001)
Defunct	-0.202†	(0.109)	-0.277*	(0.119)	-0.270*	(0.118)	-0.180	(0.113)	-0.202†	(0.114)
Size	-0.694**	(0.054)	-0.686**	(0.054)	-0.683**	(0.055)	-0.711**	(0.057)	-0.708**	(0.057)
Experience	-0.040**	(0.008)	-0.049**	(0.009)	-0.049**	(0.009)	-0.055**	(0.010)	-0.052**	(0.010)
Density	0.000**	(0.000)	0.000**	(0.000)	0.000**	(0.000)	0.000**	(0.000)	0.000**	(0.000)
Public equity market	-1.722**	(0.257)	-1.368**	(0.281)	-1.500**	(0.267)	-1.584**	(0.279)	-1.569**	(0.286)
Constant	-4.186**	(0.378)	-3.964**	(0.410)	-4.033**	(0.391)	-4.333**	(0.437)	-4.035**	(0.502)
Observations	10,949		10,949		10,949		10,949		10,949	
Number of VC firms	1,405		1,405		1,405		1,405		1,405	
log-likelihood	-885.49		-873.25		-876.81		-877.13		-871.81	

Note: ** p<0.01, * p<0.05, † p<0.1

DISCUSSION AND CONCLUSION

In this paper, organizations' social learning mechanisms were categorized into three types—information externalities, conformity-based, and network externalities. Haunschild and Miner (1997)'s work, one of the seminal pieces in inter-organizational learning literature, suggests three types of organizations' imitation patterns, namely frequency-based imitation, trait-based imitation, and outcome-based imitation. Although the present study overlaps with their work, it proposes some unique aspects of social learning mechanisms.

First, my theory can be classified as frequency-based imitation, in that it proposes that the frequency of peers' actions has an effect on a focal firm's decision-making. However, the underlying mechanism that my study proposes differs from that put forward by Haunschild and Miner (1997). I explain organizations' learning phenomenon with information externalities rather than conformity logic. In other words, organizations do not decide to follow peers' actions because they care about legitimacy and social discount. Rather, organizations tend to follow peers' actions because they believe that such actions imply meaningful information or simply because some of the actions are salient. Second, I logically negated the outcome-based imitation with firm exit context. Unlike most social learning literature that investigates the context of new market entry or practice adoption, my study is about

organizations' decision to disband. There is no more story once a firm decides to exit, so learning from the outcomes of peers' behavior is irrelevant in the present study. Lastly, regarding organizations' trait-based imitation, I suggest that reference organizations' extent of diversification can be one trait that organizations care about when imitating others. Studies of trait-based imitation have shown that an organization's status and size matter, moreover, the present study shows that the extent of diversification can be a further trait that has an impact on organizations' trait-based imitation.

My study makes the following contributions. First, this study investigates the firm exit context, which is a much under-researched area. A firm's decision to exit is undeniably overshadowed by its (market) entry activity because organizations are not likely to publicly disclose their exit decisions as those decisions are regarded as failures, deterring scholars from focusing on those decisions. Furthermore, some scholars who overemphasize the impact of social and institutional pressures on organizations' decision making focus on the most uncertain situation to lionize the role of social influence. It is no surprise that social learning studies mostly focus on the settings of practice adoption or new market entry (e.g., Lee and Pennings 2002; Greve 1998; Greve and Taylor 2000; Haunschild and Miner, 1997; Gaba and Meyer 2008; Briscoe, Gupta, and Anner 2015; Srinivasan, Haunschild, and Grewal 2007). When deciding whether to adopt a new

practice or enter a nascent market, since organizations do not have prior experience directly related to the practice or the market, they have no choice but to rely on the behaviors of other organizations. However, in reality, even if organizations predict the future on the basis of their history of prior performance feedback, when peers give discrete signals to their private information, they face huge uncertainty. Therefore, the decision to exit is a critical component of organizations' strategic decision-making, on which this study attempts to shed light.

Second, this study speaks to organizational learning literature. Prior research on organizational learning has unveiled a variety of organizational learning mechanisms, such as trial-and-error learning, performance feedback learning (Greve 2003), and vicarious learning (Kim and Miner 2007). Despite mounting studies on organizational learning processes, there has been little understanding of the interplay between such mechanisms, with a few exceptions (e.g., Schwab 2007; Baum and Dahlin 2007). By contrast, this study sheds light on the fact that organizational learning processes can only be properly understood by considering both trial-and error learning and vicarious learning mechanisms. Specifically, this study elucidates that even though organizations make decisions based on their trials, they take heed of peer organizations, and this may also influence their decision-making processes.

Lastly, there has been an upsurge of interest in organizations' behavioral decision-making processes (Greve 2013). Greve described this as research on "behavioral strategies," and classified the strategies into four categories: momentum strategies, feedback strategies, inferential strategies, and anticipatory strategies. In line with this movement, my study successfully links two strategies—feedback strategies and inferential strategies—logically with the context of organizations' exit decision-making processes. Hence, another theoretical contribution of this study is that it incorporates micro-foundations of management into population ecology theory, a macro-perspective (cf. Barney and Felin 2013).

Still, this study has a few limitations that suggest some interesting avenues for future research. As an earlier study suggested (Cattani et al. 2008), a firm's social networks may have an effect on its exit. However, the present study does not investigate the role of each firm's networks in its decision-making. Since some studies propose that the syndicate partner networks are crucial factors in the VC industry (e.g., Sorensen and Stuart 2001; 2008), I believe some results may change when considering the networks in my study. Furthermore, I use a proxy for the performance of VC firms, such as average time taken for portfolio companies in which a focal firm has invested to exit. However, this proxy may not be the best to gauge a VC firm's performance. Rather, tracking the portfolio companies' valuation

price at the point of IPO and combining such data to generate each VC firm's performance will add to the findings of the present study.

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국문초록

조직 퇴출 의사결정에서의 경험 학습과 사회적 학습 영향에 관한 연구

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본 연구는 조직이 성가 피드백에서 획득한 사적 정보를 기반으로 내리는 퇴출 의사결정이 어떻게 경쟁자들의 행동을 바탕으로 추론한 사회적 정보로 인해 조절될 수 있는지에 대한 연구다. 본 연구는 부정적인 성과를 보이는 조직들이 퇴출하지 않고 시장에 존속하는 원인으로 경쟁사들의 행동을 제시한다. 다수의 경쟁사들이 산업에 진입했을 때 조직은 부정성과를 경험했다고 할지라도 퇴출하지 않으려 한다. 경쟁사들의 행동이 향후 시장의 낙관적 전망을 반영한다고 추론하기 때문이다. 반면 다수의 경쟁사들이 시장에서 퇴출했을 경우 조직이 퇴출할 가능성은 더 높아진다. 그러나 만약 퇴출 경쟁 기업이 다수의 사업에 관여하고 있을 경우, 이 기업의 퇴출은 산업의 미래를 비관해서라기 보다는 외부 관계자에게 정체성을 확립하지 못한 것에서 기인한 비자발적 퇴출이라고 판단되어, 이러한 경쟁사들의 퇴출 행동에는 영향을 덜 받음을 밝힌다.

주요어: 성과 열망, 시장 카테고리, 조직 학습
학 번: 2014-20453