Turnover Events, Vicarious Information, and the Reduced Likelihood of Outlet-Level Exit Among Small Multiunit Organizations

Arturs Kalnins
School of Hotel Administration, Cornell University, Statler Hall 545D, Ithaca, New York 14853-6902,
atk23@cornell.edu

Anand Swaminathan
Graduate School of Management, University of California, Davis, One Shields Avenue,
Davis, California 95616-8609, aswaminathan@ucdavis.edu

Will Mitchell
Fuqua School of Business, Duke University, Box 90120, Durham, North Carolina 27708,
will.mitchell@duke.edu

A key question for organizational learning research is to identify opportunities and constraints for firms to gain useful information from the activities and performance of other firms. We argue that market-level turnover events generate and release vicarious information that small multiunit organizations can use to enhance their likelihood of survival. We focus on two specific turnover events, ownership transfers and contemporaneous exit-entry pairs (cases in which both outlet entry and outlet exit occur within the same market within the same time period), because these events are likely to generate and release information without altering the total number of outlets in a market. We find that the likelihood of a multiunit owner's outlet exit declines when there are many ownership transfers and exit-entry pairs in other markets where the owner also operates outlets. We conclude that these turnover events, even in just one market where a small multiunit organization is present, generate vicarious information substantial enough to increase the survival likelihood of all outlets of that multiunit organization. Our theory and supporting results show how organizational learning-based arguments can be combined with our knowledge of multiunit organizations to build a theory of relationships between geographically separated turnover events.

Key words: multiunit organizations; small business; geography; vicarious learning; knowledge transfer

Research in organizational theory and economics has explored the sources and effects of organizational learning (Argote 1999). Many studies find that firms learn from their own experience (e.g., Levinthal and March 1993, Darr et al. 1995, Kale et al. 2002). In parallel, though, organizational research has long recognized that firms adapt by imitating (Alchian 1950) or reacting to (Nash 1950, Chen and MacMillan 1992) others' strategies. Scholars increasingly argue that firms gain information from others' experiences (Baum and Ingram 1998, Miner and Haunschild 1995, Shaver and Flyer 2000) and change their own activities based on that information (Miner et al. 1999, Kim 2000). Following research that refers to learning from others as vicarious learning (Huber 1991), we refer to information emerging from others' activities and performance as vicarious information.

The goal of this paper is to develop and test theory regarding a common but underemphasized source of marketplace information: market-level turnover events. We focus on two types of turnover events: ownership transfers and contemporaneous outlet exits and entries within the same industry and market, which we refer to as "exit-entry pairs." This focus allows us to build on work by Ingram and Baum (1997) and Miner et al. (1999), which discusses information generated by a simpler type of turnover event: business exits. We argue that ownership transfers and exit-entry pairs generate and release vicarious information about viable strategies into the marketplace environment, but without the competitive dynamics that accompany business exits. Either of these turnover events, transfers or exit-entry pairs, may result in new owners in a market who decide to apply new business strategies and serve new niches. Incumbents can learn by observing these changes. In addition, ownership transfers may result in increased productivity at the same location (Caves 1998, McGuckin and Nguyen 1995), suggesting that they generate valuable information for observers.

Expanding these arguments to a multiunit setting, we apply the logic behind the findings of Darr et al. (1995) that multiunit franchisee owners transferred cost-saving knowledge based on one outlet's experience to other outlets they operated. We argue that, if owners benefit from

the vicarious information that ownership transfers and exit-entry pairs generate and release, then the occurrence of these events in the proximity of any of the multi-unit owner's outlets should increase the probability of survival of all outlets that the owner operates.

Beyond the contribution to the organizational learning literature, our focus on cross-market effects of turnover events provides a new vista for work in population ecology and the turnover literature in economics.[1] Those literatures have long focused on the relationships between various turnover events, but they have been limited to events within the *same* product market or across *proximate* geographic markets. The arguments that we develop about multiunit organizations outline an embryonic theory of how information flows link turnover events across geographically dispersed populations.

We test our hypotheses by analyzing the exit rates of outlets of single-unit and small multiunit organizations in three industries in Texas during the 1990s: drug stores, pizza restaurants, and video rental outlets. We define an event as an outlet exit only if the outlet shuts down or the location converts to an entirely different type of business. We do not consider ownership transfers to be exits because we wish to analyze outlets that have failed in some way. Many owners who sell their outlets receive a good price and thus have not failed at all.

From the beginning of 1991 through the end of 1999, 7,671 outlets affiliated with single-unit owners or small multiunit owners operated in Texas in these three industries, of which 3,525 exited. We exclude from our population outlets affiliated with national or regional brands, either via ownership or franchise relationships. Small nonfranchisee, multiunit organizations should be most likely to act based on vicarious information because they typically make operating decisions without the standardized routines of franchisors or large national chains. Therefore, they are the most appropriate objects for this study.

The paper proceeds as follows. The background section identifies information sources that owners of small businesses use, drawing on the scholarly literature and information that emerged from our own interviews of small business owners, and reviews existing work that has considered how outlet-level exits and entries influence survival. We then develop hypotheses regarding the benefits generated by vicarious information resulting from ownership transfers and exit-entry pairs. Finally, we test the hypotheses and discuss the results.

Background

Information Seeking by Small Businesses
Surveys conducted by scholars of small business management suggest that small firms analyze their competitors and use the analyses to innovate. These findings are consistent with the premise that firms will be aware of transfers, exits, and entries taking place in their vicinity, that these events contain valuable information, and that owners benefit from using this information.

Several studies show that small businesses analyze their competitors. Brush (1992) surveyed 66 new manufacturing ventures with average annual production of $3 million and found that 69% regularly or continuously collect information regarding their competitors' strategies, while 79% collect information about competitors' products. In addition, 52% collected information about new entrants into their market. Based on surveys of 132 organizations with 100 employees or less, Johnson and Kuehn (1987) found that managers of small firms spend more time gathering information about the marketplace, including competitors and entrants, than they did about growth issues (e.g., new facilities, achieving economies of scale) or about technology (e.g., improving products and processes).

How do small businesses gather information about competitors? Johnson and Kuehn (1987) found that customers, employees, and suppliers were most likely to supply marketplace information. Fann and Smeltzer (1989) confirmed this result for a sample of 48 small businesses. They emphasized that customers were an important conduit through which firms received information about their competitors. Those authors also found that turnover events such as exits and entries into new markets are two of the four most important types of information about competitors for a firm's long-range planning. Finally, small businesses appear to gain ideas regarding innovation from observing competitors. Hartman et al. (1994) found that information about competitors is the second most important source that spurs innovation, behind only ongoing analysis of the firm's own products. Interestingly, competitor information was more important in this regard than information about either customers or employees.

Interviews with Pizza Restaurant and Video Store Owners
For this study, we interviewed 12 owners of pizza restaurants and video rental stores regarding the importance of learning about their competitors' activities and specifically about the role of ownership transfers in releasing information. The interviews offer supplemental support for our theory and statistical analysis. Six of 12 owners that we contacted reported that they were aware of ownership transfers at competitors' locations and that they gained information as a result of the ownership transfer. Three others said that they do monitor their competitors, but that they were not aware of any ownership transfers that had taken place in their vicinity. The remaining three told us they never pay attention to competitors, because there were either too few or too many to keep track of.

How did the owners find out about ownership transfers? All six owners that had identified ownership transfer information mentioned that customers told them about ownership changes, three stated that vendors mentioned the changes, and three stated that they heard the news from employees. In addition, one video store owner and one pizza restaurant owner emphasized that the incumbent owners knew each other and relayed such information among themselves. One owner stated that new owners sometimes came to their store to introduce themselves. More details from the interviews follow below.

Information Contained in Outlet Exits and Entries
Previous academic work on turnover has focused on how business exits and entries influence the survival of incumbent firms and outlets. Research shows that business exits influence the survival rates of competing businesses (Ingram and Baum 1997, Kim 2000). In part, the survival benefits arise because the exits generate vicarious information about the ineffectiveness of the exiting firm's strategies. For example, the exit of an airline such as People's Express that offered only low-cost service could induce surviving airline firms to implement a differentiation strategy (Miner et al. 1999).

In addition to generating vicarious information, though, business exits involve unrelated issues that would affect the likelihood of exit of other outlets in the vicinity. Carroll and Delacroix (1983) argue that exits free resources for surviving outlets and signal that there is low demand in a market. That is, exits allow resources such as customers and employees to become available for other existing organizations, while signaling that a market is suffering from the "noxious countervailing force" of insufficient demand (Carroll and Delacroix 1983, p. 279). Resource availability should decrease the exit probabilities of multiunit owners' outlets, as should the presence of vicarious information, while signals of insufficient demand should be associated with increased probabilities of exit.

Much like the case of exits, entries also have multiple influences that can affect the survival of incumbent firms or outlets. On one hand, entries provide new information to incumbents about appropriate strategies and routines. On the other hand, entries lead to increased competition and fewer resources for incumbent outlets (e.g., Bresnahan and Reiss 1991, Toivanen and Waterson 2005).

In contrast to entries and exits, ownership transfers and contemporaneous exit-entry pairs in a market are turnover events that do not change the number of outlets in a market. We focus on ownership transfers and exit-entry pairs in markets in which an owner operates, other than the market of the outlet at risk. This strategy further isolates the effects of vicarious information from other mechanisms that may affect survival rates. We do not make hypotheses about the effect of transfers

or exit-entry pairs in the same-market as the outlet at risk. Though same-market turnover events are likely to release important vicarious information, the transfers have other consequences that may confound any observable effect on outlet performance or survival. For example, McGuckin and Nguyen (1995) examined how ownership transfers in the form of acquisitions affect incumbent performance, but the mechanisms involved tougher direct competition from new, more productive owners. Alternatively, changing demographic or economic conditions in a market might yield many ownership transfers and few exits in the same market, but the relationship between the two may not be causal.[2] Nonetheless, we do include same-market turnover events in our empirical analysis as important control variables.

Hypotheses

The Effects of Ownership Transfers on the Likelihood of Exit
Ownership transfers are cases in which new owners undertake operation of existing business outlets. We argue that ownership transfers generate and release vicarious information. Ownership transfers at the retail and service outlet level are visible events. Customers, suppliers, and direct competitors are likely to be aware of a transfer from a change in physical appearance at the outlet or perhaps from a prominently displayed "under new management" banner. As we found in our interviews, many owners are aware of these transfers and pay attention to them. They are able to gain information about the transfers not only from their own direct observation but also indirectly through their networks of customers and suppliers. We discuss two reasons why transfers are likely to generate and release valuable information to competitors: the first related to different strategies used by the new and previous owner of the transferred outlet, and the second related to the movement of employees following an ownership transfer.

Economists have developed and tested the matching theory of ownership transfers. According to the logic of this theory, ownership transfers take place because external shocks over time reduce the fit between an existing owner's skills and those required for successful ongoing operations (Caves 1998). Individuals whose skills would bring greater value from an existing location should be willing to pay the existing owner (who lacks those skills) a premium, relative to what the existing owner could earn by operating the outlet, to assume ownership. Consistent with this argument, McGuckin and Nguyen (1995) found that productivity went up after ownership changes at manufacturing plants. While the matching theory does not discuss operating changes explicitly, it follows that the new owner will make changes in the strategies, routines, and policies of the organization to gain productivity benefits from their skills.

Even if new owners do not possess superior capabilities, organizational change may result merely from their belief that they can extract improved performance from their outlets (see, e.g., Camerer and Lovallo 1999, on overconfidence). On the one hand, Sorenson and Waguespack (2005) report that such beliefs may result in self-confirming outcomes. In our setting, owners may invest greater effort in the markets they believe have the most potential, even if there is no objective reason for them to be optimistic. Their increased efforts should be observable and should generate vicarious information. On the other hand, Kalnins (2005) found that owners who were the most bullish before entry about a given market's potential were the most likely to exit that market. The actions of overconfident owners also yield valuable vicarious information (Bernardo and Welch 2001).

As we noted above, ownership transfers are events that are visible by direct observation and via indirect communication from customers and suppliers. Thus, owners of outlets proximate to that undergoing an ownership change should be able to analyze the ownership transfer as a "natural experiment," with the ownership change acting as the manipulation. They can compare the actions of the previous owner and the new owner and identify features to incorporate into their own strategies. For example, an ownership transfer that involves a change of décor may suggest to the multiunit owners that they should avoid remodeling outlets in a fashion similar to the transferred outlet under its previous owner. The transfer may allow the multiunit owner not only to conclude that particular strategies or routines of the previous owner were ineffective, but also that the new owner's approach may be superior. Even if the new owners in a market are less likely to succeed than their predecessors, their use of new business strategies and service of new niches can provide incumbents with valuable information. Incumbent owners can observe their initial performance and evaluate whether their strategies should be copied or avoided.

The owners we interviewed had varied opinions on whether competition became tougher after ownership transfers. One owner stated that there was "less [competition]; we get some of those customers that used to go to the previous owner's store," while another stated, "Depends. Sometimes tougher competition, sometimes [we] get lucky and fresh ownership with lack of experience, then it goes in our favor." Overall, five of the six interviews noticed new owners doing things differently from the previous owners: substantial remodeling, new product mix, new displays, new menu items, and new types of promotion. Importantly, four said that they had adopted specific practices as a result of their observations.

A second mechanism through which incumbent firms can gain information from an ownership transfer is the turnover of employees from the outlet whose ownership is changing, whether or not the outlet's productivity has improved posttransfer. Ownership transfers increase the likelihood that employees will leave the firm. Sorenson and Audia (2000) and Klepper and Sleeper (2002) argue that some departing employees start their own new ventures, often in the vicinity of their prior employer. In addition, though, competitors hire many other departing employees. Employees often serve as repositories for tacit knowledge (Argote and Darr 2001) and take substantial information regarding the strategies and operations from their old employer to the new (Almeida and Kogut 1999). Hence, incumbents in the vicinity can benefit from the information provided by employees that they hire away from other outlets undergoing ownership changes. In this case, the ownership transfer facilitates the release of information.

Two pizza store owners mentioned to us that employee turnover is the primary means through which they acquire important vicarious information, as well as a way they find out about ownership transfers. One owner noted how ownership transfers affect employees, stating, "Cooks don't like it when businesses change owners." This owner stated that he has hired many employees that way. These employees have provided information about quality of various vendors, ingredient proportions, and substitutable products.

The last piece of logic that our first hypothesis requires is that owners can transfer information among their outlets. Evidence exists that owners transfer information from outlet to outlet, implying that vicarious information can diffuse among outlets of the same multiunit owner. Darr et al. (1995) found that cost-reducing information at pizza restaurants based on an outlet's own experience was shared with outlets of the same multiunit owner. Similarly, Mitchell et al. (2002) showed that capabilities transferred from nursing home chains to their newly acquired outlets, and Ingram and Simons (2002) observed transfers between kibbutzim of the same federation. Within the small multiunit business organizations that we study here, the mechanism for the transfer of information from one outlet to others is straightforward: Most often, the owners transfer the information themselves during their visits to their individual outlets. Employees typically are willing to provide the owners with information, and the owners share the information with their other locations during their next visit.

HYPOTHESIS 1. *The greater the number of ownership transfers that occur in other markets in which a multiunit owner operates, the lower the probability of exit of an outlet of the multiunit owner.*

Ownership Transfers with and Without Changes of Business Name

In this section, we argue that, while all ownership transfers should provide some vicarious information, transfers of outlets that change the "doing business as" name

provide more vicarious information than those that keep the original name. Some outlets will be sold because owners simply wish to retire or change their lifestyle. In such cases, the business often was doing well before the sale, and the new owner will maintain the strategies and operational routines of the previous owner. Further, the retention of the business name is a strong signal to customers that the products or services will be the same. In fact, a new owner who keeps the name often pays a goodwill premium for that name beyond the value of the physical property and equipment, specifically because the name and its associated products, strategies, and routines are of value to a group of customers.

Thus, incumbents within a market are likely to learn more from ownership transfers involving name changes, which typically indicate that the first owner was struggling or had poor prospects. Incumbents can observe the strategies and routines of the new owner and compare how they differ from those of the exiting owner. Our argument here is similar to that of Kim (2000), who argued that near-failure experiences contain more vicarious information than outright failures. Ownership transfers with name changes are likely to be near failures, which will contain information not only about routines or strategies that do not suit a particular market, but also about the potentially viable strategies that new owners initiate following the transfer.

HYPOTHESIS 2. *Ownership transfers with a change in business name that occur in other markets in which a multiunit owner operates will reduce the probability of exit of an outlet of the multiunit owner more than ownership transfers that keep the same name.*

Exit-Entry Pairs Within a Market
Like ownership transfers, outlet-level entries and exits contain vicarious information about strategies and routines that may be useful for others in the market. A new outlet's routines and strategies may be particularly worthy of imitation, while firms will commonly want to avoid the routines and strategies of a failed outlet. As we noted above, though, entries and exits also produce confounding effects beyond vicarious information. Entries reduce available resources but signal a market's viability, while exits free resources but also signal insufficient demand.

Exit-entry pairs are cases in which an entry is matched by an exit during the same time period in the same market. More so than cases of exit or entry alone, exit-entry pairs give others the opportunity to learn vicariously. Managers and owners of other outlets can observe the strategies and routines of the outlet that exits and associate them with the failure of the outlet, while associating the strategies and routines of the new outlet with at least one firm's assessment of successful strategies. We hypothesize that owners will transfer this information from their markets with exit-entry pairs to all their

other outlets and therefore will be less likely to exit at any of their locations. We contrast exit-entry pairs with excess entries and exits, where *excess entries* are entries that exceed the number of exits during the same time period in the same market, and *excess exits* are exits that exceed the number of entries.

HYPOTHESIS 3A. *The greater the number of exit-entry pairs that occur in other markets in which a multiunit owner operates, the lower the probability of exit of an outlet of the same multiunit owner.*

HYPOTHESIS 3B. *The effect of exit-entry pairs that occur in other markets in which a multiunit owner operates (Hypothesis 3a) will be significantly stronger than the sum of the separate effects arising from excess entries and exits that occur in other markets in which the multiunit owner operates.*

Research Design

Data
We focus on the survival and exit of nonfranchised outlets within three industries in Texas between 1991 and 1999: drug stores, pizza restaurants, and video rental outlets. We analyze the occurrence of 3,525 exits among 7,671 outlets of single-unit and small multiunit organizations, which we define as owning from one to 20 outlets. We exclude outlets affiliated with franchisors. Of these 7,671 outlets, 2,835 are drug stores, 2,143 are pizza restaurants, and 2,693 are video rental outlets.

We chose these industries because of their extensive turnover, including many entries, exits, and ownership transfers. During our period of study, there were 631 ownership transfers in these three industries where the new owner assumed a new business name and 851 where the business name remained the same after the change of owner. There were 1,640 cases of exit-entry pairs in the same zip code in the same time period. We use zip codes as empirically convenient measures of geographic proximity because they commonly share transportation and other economic and social features for which vicarious information is relevant. We explore alternative market definitions in the sensitivity analyses described below.

While we believe that vicarious information will also help outlets affiliated with franchisors and with large national chains, we exclude these outlets from our analysis because they are more complex organizations. Franchisors often constrain their franchisees' ability to react to vicarious information. The franchisor is typically responsible for developing and enforcing organizational routines (Knott 2001), and franchisees are often forbidden to make "strategic local responses" such as changing a menu item to serve local tastes (Bradach 1998, p. 23). Nonetheless, we discuss sensitivity analyses that include franchisor-affiliated outlets.

Further, the analysis of small nonfranchisee owners reduces the possibility that an exit-reducing effect on a multiunit owner's outlet that appears to stem from turnover events in the other markets actually results from multimarket interaction, a la Baum and Korn (1996) or McGrath et al. (1998). Of 1,482 ownership transfers in our data, only 20 involved outlets with direct multimarket contact with the owner of the outlet at risk.

We chose Texas because the State Comptroller's Office provided us with complete entry and exit data from 1990 through 1999 at the business outlet level, including address, business name, owner name and address, and entry and exit date. Because we need year of exit and entry data preceding each at-risk period to test our hypotheses, we begin our analysis of outlets at risk in January 1991. To our knowledge, Texas is the only state that makes such detailed business data available. Many states do not provide data because of confidentiality, while some states (e.g., California) provide information only about existing outlets without detailing entry or exit dates. Fortunately, Texas is a large and varied state, so it represents types of locations that exist throughout the United States, such as urban and rural areas, areas along major highways, and coastal resorts. Therefore, our results are likely to generalize to other North American markets. We note that Kalnins and Mayer (2004) previously conducted a survival analysis using the pizza restaurant data, while no academic study has used the drug store or video data sets. Even for the pizza data, no studies have analyzed the turnover variables of theoretical interest here.

We include as observations the outlets of single-unit owners even though they had no other outlets that could help them gather vicarious information to use in other markets. Outlets of single-unit owners add relevant information for the identification of control variables, and they act as a falsification test. A strong test of our hypotheses should find that, while multiunit owners enjoy higher survival rates, single-unit firms in the same market do not benefit from ownership transfers or exit-entry pairs in other markets where their multiunit neighbors operate. We note that sensitivity analyses that excluded the outlets of single-unit owners as observations in our analyses did not change any of the results we present below.

Method and Variable Definitions

We used event history analysis to test the hypotheses. Specifically, we used parametric hazard models, which require that a functional form for the transition rates be specified. We estimated regressions using the piecewise exponential, Gompertz, and Weibull forms. Because our results did not differ based on the model used, we present results using the piecewise exponential model, which is a flexible approach that allows the hazard rate

to change over time. Following Blossfeld and Rohwer (1995, p. 116), this model takes the following form:

$$r(t) = (\exp\{\bar{\alpha}_l + \mathbf{A}\alpha_l\}). \qquad (1)$$

In Equation (1), $\bar{\alpha}_l$ is the constant for the lth time period. The hazard rate can vary across time periods without restriction but is assumed to be constant within a time period. The $\mathbf{A}$ vector contains the covariates, and the estimates of the coefficients appear in the α_l vector. In the analysis that follows we estimate models with period effects with three time periods corresponding to outlets aged 0–2 years, 3–5 years, and greater than 5 years. Because the values of all our covariates of theoretical interest change over time, we split the life histories of all outlets into yearly spells and set all covariates for each spell to their values at the beginning of that year (see, e.g., Ingram and Baum 1997). We then estimated the parameters using maximum likelihood analyses, clustering on location to generate robust standard errors.

Many of the drug stores, pizza restaurants, and video rental outlets were in business before 1990, meaning that part of our population is left truncated—outlets that entered and exited before 1990 are not in the population. Including outlets founded before 1990 but exiting after 1990 in the analysis does not cause left-censoring problems because the Texas data sets contain information of the founding dates, even if those are before 1990. For example, the event history model will only analyze an outlet founded in 1985 with others that have survived until the fifth year. The outlet will never be directly compared to outlets in the first four years after founding. Thus, the analysis avoids problems of left censoring (see Guo 1993; Stata Corp 2001, pp. 441–446).

The dependent variable for the event history analysis is outlet-level exit. Outlets are at risk of exit until they have permanently closed down. We do not consider outlets to have exited merely due to changes of ownership or business name, as long as someone is operating the same type of business at that location. We note that finer-grained financial performance data are not available for a large group of privately owned outlets. Because the coarseness of exit as a dependent variable may obscure some effects of vicarious information (e.g., the information improves profits but is not strong enough to influence exit rates), any effects that are observed to be reducing exit are likely to be particularly strong.

The two main independent variables of theoretical interest are the count of ownership transfers within the same industry that take place in other zip codes in which a multiunit owner has outlets (Variable 1, Hypothesis 1) and the count of exit-entry pairs within the same industry that take place in other zip codes in which a multiunit owner has outlets (Variable 4, Hypothesis 3a). The counts are calculated in the year before each period in

which the outlet is at risk. Sensitivity analyses found results at the same levels of significance using a two-year period before each spell, even though the analysis required the removal of all observations from 1991 from the population so that the additional year's lagged independent variables could be calculated.

To calculate the transfers in these other zips variable (Variable 1) for an outlet x of a multiunit owner that owns outlets x, y, and z in three different markets (zip codes), we count the number of ownership transfers in the vicinity of outlets y and z in the previous year, including only those of nonfranchised outlets whose owners own 20 or fewer outlets. Similarly, we include the counts in the zip codes of x and z in the variable for outlet y. Variables 2 and 3 are Variable 1 split into two separate counts, depending on whether the ownership transfer involved a change of business name or not.

We determined that a transfer occurred when an individual with a different surname was listed as an outlet's new owner. In some cases, the outlet was listed with multiple serial owners, where the old owner was a person or a corporation and the new owner was a different corporation. We checked such cases against the Texas Secretary of State's incorporation database to determine the actual owners. If the same individual appeared as an owner of both corporations, we concluded that an ownership transfer did not take place.

To calculate the exit-entry pairs in these other zips variable (Variable 4) for an outlet x of a multiunit owner that owns outlets x, y, and z in three different markets (zip codes), we count the number of pairs of exits and entries in the vicinity of outlet y and the number of pairs of exits and entries in the vicinity of z in the previous year. Like the case of transfers, both the exits and entries must be of nonfranchised outlets with small owners and both must be in the same market. On the one hand, the count of exit-entry pairs can be large or small, and the amount of net entry can still be zero. On the other hand, if outlet y only has exits in its vicinity and outlet z only has entries in its vicinity, the exits and entries are not considered to be a pair. In this case, the value of the exit-entry pairs in these other zips variable would be zero, but net entries and exits will be greater than zero. The exits in the vicinity of outlet y would be included in the excess exits in these other zips variable (Variable 5), and the entries close to z would be included in the excess entries in these other zips variable (Variable 6).

We did not base hypotheses around the excess exit and entry variables because their role as a consistent source of vicarious information remains unclear. If a market experienced many exits due to insufficient demand, these events will provide little valuable vicarious information that an owner can use in other markets. Instead, the exits simply mean that a particular market is unattractive.

Similarly, many entries may merely signal high growth of a new market.

The final control variable counted across all the other markets with a multiunit owner's outlets is the sum of existing outlets in these zips, excluding the zip of the outlet at risk and the contiguous zips (Variable 7). Zip codes with more total outlets are more likely to experience entries, exits, and ownership transfers. Thus, the presence of the total existing outlet variables ensures that simple counts of outlets of the same industry are not generating the results attributed to ownership transfers or exit-entry pairs. We do not include a squared term for this variable because there is little theoretical reason to believe that a competition effect exists across markets, but sensitivity analyses that did include the squared term did not reduce the level of support for any of our hypotheses. We also note that results remained significant (marginally so in the case of ownership transfers) when the existing outlets variable was not included in the regressions.

To ensure that the markets of the multiunit owner's other outlets are geographically distinct from the market of that owner's outlet at risk, we do not include counts in zip codes that are contiguous to that of the zip code of the outlet at risk in Variables 1–7. Ownership transfers in neighboring zip codes might really be in the same market with those within the zip code of the outlet at risk. As described immediately below, the turnover events in all contiguous zip codes are counted in the control variables for turnover events in the same market as the outlet at risk.

We include turnover control variables for the same market as the outlet at risk (Variables 8–13). In particular, we include the count of ownership transfers, exit-entry pairs, excess exits, and excess entries, summed not only in the same zip code as the outlet at risk, but also across all contiguous zip codes. We also include the traditional density variables found to be significant in many population ecology studies (see Carroll and Hannan 2000, p. 218), the count of existing outlets in a market and its squared term, again using the same zip code and the contiguous zip codes. Sensitivity analyses using only the counts in the same zip as the outlet at risk did not alter in any way the signs or significance levels of the variables of theoretical interest (Variables 1–4). However, there were important differences in the significance levels of the control variables themselves. These are discussed in the Results section.

Third, we include three measures of market conditions. We include zip code population and per capita income from the 1990 census (Variables 14 and 15) to identify markets that firms may consider to be larger and more lucrative. In addition, retail growth in zip (Variable 16) records the count of entries less exits of retail outlets in the two years previous to the current spell. Sensitivity analyses report no significant differences in results if these variables are broadened to include the

contiguous zip codes, much like the counts of turnover events.

Finally, we include several owner and outlet characteristics. First, we include a firm's size in number of outlets (Variable 17) and a squared term (Variable 18). Larger firms operate in more zip codes and thus will be able to observe more ownership transfers. This control ensures that results regarding ownership transfers in other zips do not arise from a simple size effect. Second, we include the experience of an owner in the vicinity of the outlet at the time of the outlet's founding, which Huber (1991) refers to as congenital experience (Variable 19). This variable is measured as in Baum and Ingram (1998), using a square-root discount factor, and using the closest 25 outlets to be consistent with Kalnins and Mayer (2004). Third, we include a dummy variable for whether an outlet has transferred ownership (Variable 20), which allows us to determine whether transfers improve performance as per the matching theory we discussed above. Fourth, we include the logged distance from the outlet to its owner's headquarters (Variable 21). Fifth, as we discussed earlier, we include three cohorts of outlet age (Variables 22–24). Finally, though not shown in the tables (to save space), we included separate industry/year intercepts. In other words, there is a separate intercept for drugs stores 1992, drugs stores 1993, pizza restaurants 1996, etc. Thus, the baseline failure rate can vary for each year for each industry. Table 1 reports descriptive statistics and correlations for all the variables.

Results

Core Results

Table 2 reports four exponential hazard models that analyze likelihood of outlet exit. The first model includes the two main count variables for other zips with outlets of the same owner. The transfers in these other zips variable (Variable 1) tests Hypothesis 1, while the entry/exit pairs in these other zips variable (Variable 4) tests Hypothesis 3a. The negative and statistically significant coefficients on both of these variables show strong support for both hypotheses. The more ownership transfers and exit-entry pairs that occur in other markets in which a multiunit owner operates, the lower the probability of exit of an outlet of the same multiunit owner. Further, a chi-squared comparison of the coefficient of the exit-entry pairs variable with the sum of the excess entries in these other zips variable and the excess exits in these other zips variable (Variables 5 and 6) is displayed at the bottom of the columns associated with Model 1. The significant chi-squared statistic tests Hypothesis 3b: The effects of exit-entry pairs that occur in other markets in which a multiunit owner operates are significantly stronger than the separate effects of entries and exits that occur in those other markets.

To test Hypothesis 2, Model 2 splits the transfers in these other zips variable into the two types of transfers: transfers with a change of name and transfers that keep the same name. The analysis first reports that both types of transfers lead to a lower chance of exit in other zips, in parallel with Hypothesis 1. The split of the ownership transfers variable demonstrates significant exit-reducing effects for transfers that have changed business name and marginally significant effects for those that have not changed business names.

To test Hypothesis 2, a chi-square test comparing the magnitude of the coefficients of these two variables is displayed at the bottom of the columns for the second model. While the coefficients have the expected relative magnitude, the results do not support Hypothesis 2. Although the transfers with a change of name variable has a coefficient that is larger both in absolute magnitude and in terms of statistical significance, the chi-squared test on the difference between the two variables has an insignificant value of 0.87. Nonetheless, the direction of the results suggests that transfers with a change of name have the most impact.

We note that the excess exits in these other zips and excess entries in these other zips with outlets of same owner (Variables 5 and 6) were insignificant. While these were control variables in this study, the noneffect of the exits variable may be surprising because of past work (e.g., Miner et al. 1999) that discusses the ability of firms to benefit from the presence of exits. While multiunit owners could transmit any knowledge acquired based on exits in the vicinity of their outlets, much like they appear able to do for the case of ownership transfers, it is not clear what proportion of exits are in fact a source of vicarious information. If a market experienced many exits due to insufficient demand, for example, these events do not likely provide valuable vicarious information that an owner can use in other markets. Instead, as we noted above, it may only mean that a particular market is not attractive.

In addition to the variables of theoretical interest, several controls are significant in Models 1 and 2. Most important, we observe statistically significant coefficients for the turnover events in the same market (Variables 8 and 9) of the same sign as those in the multiunit owners' other markets (Variables 1 and 4). Both ownership transfers and the exit-entry pairs in the same market as the outlet at risk have a negative and significant effect on the likelihood of exit, with the market definition being the same zip code plus the contiguous zip codes. However, we state three caveats regarding these results. First, these variables are only marginally significant and only become significant when we use this broad definition of the local market. The variables are not significant when we include turnovers only if they are in the same zip code as the outlet at risk. Second, the coefficients are far smaller than those for the transfers

Table 1 Correlations and Descriptive Statistics ($N = 29{,}663$)

Correlations	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
(1) Transfers in these other zips	1.0																							
(2) Transfers with a change of name	0.67	1.0																						
(3) Transfers that keep the same name	0.86	0.19	1.0																					
(4) Exit-entry pairs in these other zips	0.19	0.09	0.19	1.0																				
(5) Excess exits in these other zips	0.21	0.11	0.21	0.29	1.0																			
(6) Excess entries in these other zips	0.24	0.20	0.18	0.15	−0.03	1.0																		
(7) Existing outlets (density) in these other zips	0.43	0.31	0.36	0.45	0.41	0.45	1.0																	
(8) Transfers in same market	0.01	0.01	0.01	0.01	0.00	0.03	0.00	1.0																
(9) Exit-entry pairs in same market	0.02	0.01	0.01	0.03	0.01	0.03	0.00	0.35	1.0															
(10) Excess exits in same market	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.09	0.17	1.0														
(11) Excess entries in same market	0.02	0.00	0.02	0.01	0.02	0.01	0.01	0.08	0.09	−0.11	1.0													
(12) Existing outlets (density) in the same market	0.03	0.03	0.02	0.03	0.02	0.05	0.06	0.47	0.48	0.14	0.11	1.0												
(13) Existing outlets (density) squared	0.02	0.02	0.01	0.02	0.02	0.04	0.04	0.47	0.46	0.12	0.10	0.92	1.0											
(14) Population of zip (10,000s)	0.06	0.04	0.05	0.06	0.05	0.05	0.09	0.17	0.21	0.20	0.17	0.30	0.22	1.0										
(15) Income of zip ($10,000s)	0.03	0.01	0.03	0.01	0.02	0.04	0.04	0.13	0.11	0.03	0.00	0.06	0.00	0.09	1.0									
(16) Retail growth in zip (10s)	0.03	0.00	0.04	0.06	0.03	0.05	0.08	0.05	0.12	0.14	0.07	0.12	0.07	0.39	0.26	1.0								
(17) Multiunit owner's size (in number of outlets)	0.36	0.25	0.30	0.33	0.39	0.38	0.75	−0.01	−0.01	0.01	0.00	0.03	0.03	0.08	0.01	0.06	1.0							
(18) Multiunit owner's size squared	0.34	0.24	0.29	0.31	0.36	0.35	0.74	−0.01	−0.02	0.01	−0.01	0.03	0.03	0.05	0.00	0.05	0.94	1.0						
(19) Local congenital experience	0.17	0.16	0.12	0.20	0.22	0.18	0.36	−0.04	−0.03	0.00	−0.01	−0.02	−0.01	0.05	−0.08	0.02	0.55	0.46	1.0					
(20) Outlet has transferred ownership	0.16	0.09	0.15	0.13	0.19	0.19	0.32	0.00	0.00	0.03	0.01	−0.02	−0.02	0.05	0.10	0.07	0.41	0.33	0.14	1.0				
(21) Log distance to owner's HQ from outlet	−0.02	−0.01	−0.02	−0.02	0.00	−0.02	−0.02	0.10	0.06	0.00	0.02	0.05	0.05	0.04	0.07	−0.08	−0.02	−0.01	−0.02	0.02	1.0			
(22) Outlet age: 0–2 years	−0.01	0.00	−0.01	−0.01	−0.01	0.00	−0.03	0.07	0.10	0.05	0.04	0.00	0.01	0.02	0.09	0.01	−0.01	−0.01	−0.06	0.08	0.37	1.0		
(23) Outlet age: 3–5 years	0.01	−0.01	0.02	0.03	0.02	0.03	0.02	0.04	0.06	0.04	−0.01	0.00	0.01	0.02	0.07	0.04	0.04	0.02	0.02	0.07	−0.02	−0.34	1.0	
(24) Outlet age: 6+ years	0.00	0.01	−0.01	−0.01	−0.01	−0.02	0.01	−0.10	−0.14	−0.08	−0.02	0.00	−0.02	−0.04	−0.14	−0.04	−0.03	0.00	0.03	−0.13	−0.30	−0.57	−0.58	1.0
Descriptive statistics																								
Mean	0.03	0.01	0.02	0.03	0.07	0.06	0.86	0.27	0.32	0.12	0.15	5.3	54	0.21	0.26	0.18	2.4	14	0.22	1.2	0.19	0.25	0.26	0.50
Standard deviation	0.22	0.11	0.16	0.21	0.37	0.33	3.1	0.65	0.70	0.40	0.42	5.1	102	0.15	0.10	0.25	3.0	46	0.63	1.8	0.45	0.43	0.44	0.50
Minimum	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0.05	−0.81	1	1	0	0	0	0	0	0
Maximum	4	2	4	6	6	6	41	8	7	5	5	31	961	0.79	0.77	3.2	20	400	7	8.1	2	1	1	1

Table 2 Exponential Hazard Regressions on Outlet Exit (Nonfranchised Outlets of Single-Unit and Small Multiunit Owners—Up to 20 Units)

	1: H1, H3a, H3b		2: H2		3: Contiguous zips		4: Falsification test	
	Coeff.	Std. error	Coeff.	Std. error	Coeff.	Std. error	Coeff.	Std. error
Counts in other zips with outlets of same owner								
(1) Transfers in these other zips (H1:-)	−0.236**	(0.084)			−0.255**	(0.086)	−0.238**	(0.084)
(2) Transfers with a change of name			−0.362*	(0.170)				
(3) Transfers that keep the same name			−0.177+	(0.099)				
(4) Exit-entry pairs in these other zips (H3a:-)	−0.356**	(0.099)	−0.361**	(0.099)	−0.378**	(0.101)	−0.354**	(0.099)
(5) Excess exits in these other zips	−0.046	(0.050)	−0.047	(0.050)	−0.054	(0.051)	−0.046	(0.050)
(6) Excess entries in these other zips	0.020	(0.050)	0.021	(0.051)	0.003	(0.052)	0.021	(0.050)
(7) Existing outlets (density) in these other zips	0.045**	(0.008)	0.045**	(0.008)	0.044**	(0.008)	0.045**	(0.008)
Comparison test variables								
(C1) Transfers					0.033	(0.036)	−0.040	(0.034)
(C4) Exit-entry pairs					0.024	(0.034)	−0.030	(0.046)
Counts in same market as outlet at risk (same market = same zip + contiguous zips)								
(8) Transfers in same market	−0.052+	(0.028)	−0.052+	(0.028)	−0.053+	(0.028)	−0.053+	(0.028)
(9) Exit-entry pairs in same market	−0.046+	(0.026)	−0.046+	(0.026)	−0.046+	(0.026)	−0.046+	(0.026)
(10) Excess exits in same market	0.050	(0.035)	0.050	(0.035)	0.050	(0.035)	0.050	(0.035)
(11) Excess entries in same market	−0.041	(0.041)	−0.041	(0.041)	−0.043	(0.041)	−0.044	(0.041)
(12) Existing outlets (density) in same market	−0.015+	(0.008)	−0.015+	(0.008)	−0.016+	(0.008)	−0.015+	(0.008)
(13) Existing outlets (density) squared	0.001*	(0.000)	0.001*	(0.000)	0.001*	(0.000)	0.001*	(0.000)
Other controls								
(14) Population of zip (10,000s)	−0.055	(0.126)	−0.053	(0.126)	−0.053	(0.126)	0.002	(0.129)
(15) Income of zip ($10,000s)	0.272+	(0.160)	0.271+	(0.160)	0.258	(0.160)	0.332*	(0.163)
(16) Retail growth in zip (10s)	0.089	(0.086)	0.087	(0.086)	0.091	(0.086)	0.090	(0.086)
(17) Multiunit owner's size (in number of outlets)	−0.068**	(0.018)	−0.068**	(0.018)	−0.073**	(0.019)	−0.079**	(0.019)
(18) Multiunit owner's size squared	0.002*	(0.001)	0.002*	(0.001)	0.003*	(0.001)	0.003**	(0.001)
(19) Local congenital experience	−0.025	(0.031)	−0.023	(0.031)	−0.020	(0.031)	−0.022	(0.031)
(20) Outlet has transferred ownership	−0.057	(0.048)	−0.057	(0.048)	−0.058	(0.048)	−0.057	(0.048)
(21) Log distance to owner's HQ from outlet	0.073**	(0.009)	0.072**	(0.009)	0.072**	(0.009)	0.073**	(0.009)
(22) Outlet age: 0–2 years	−3.289**	(0.106)	−3.290**	(0.106)	−3.275**	(0.107)	−3.290**	(0.107)
(23) Outlet age: 3–5 years	−3.200**	(0.104)	−3.201**	(0.104)	−3.187**	(0.105)	−3.200**	(0.105)
(24) Outlet age: 6+ years	−3.454**	(0.100)	−3.455**	(0.100)	−3.442**	(0.101)	−3.453**	(0.101)
Chi-squared tests for significant relationships among variables	H3b; |4| > |5| + |6|: 6.24*		H2; |2| > |3|: 0.87		|1| > |C1|: 9.06** |4| > |C4|: 12.59**		|1| > |C1|: 4.87* |4| > |C4|: 8.84**	
Pseudo log likelihood of regression	−5,703		−5,703		−5,702		−5,702	

Note. 3,525 failures, 7,671 outlets total at risk (36,015 total years at risk): All regressions include separate intercepts for each industry/year combination.

*p < 0.05; **p < 0.01; +p < 0.10 (two-tailed tests).

and exit-entry pairs in the multiunit owners' other zip codes. This suggests that some opposing force in the local area is mitigating the effects of vicarious information made available by the turnover events. Third, while significance of these variables supports the "same market" equivalents of Hypotheses 1 and 3a, chi-square tests (not shown) are unable to support Hypotheses 2 and 3b.

One factor that is encouraging about the broader definition of local market is that the density variables (counts of existing organizations) are significant and consistent with the basic findings of population ecology. The density variable is positive and significant while its squared term is negative and significant, demonstrating the typical S-shaped curve that results from the forces of legitimation and competition (see Carroll and Hannan 2000, p. 218). Our setting makes this finding interesting because it presents some additional evidence that, following Greve (2002), the density dependence results hold in a microgeographic context. The density variables are not significant when only the same zip code is used.

This suggests that we have accurately defined a "local market," at least to the extent that legitimacy and competition are concerned, by including the outlet counts in contiguous zip codes. Regardless of the definition used, or whether these "same market" counts (Variables 8–13) are included at all, we found no variation in the coefficients of the turnover variables in the multiunit owners' other zip codes (Variables 1–4).

Other control variables also deserve our attention. Multiunit owner's size (in number of outlets) (Variable 17) is strongly negative and significant, and its squared term (Variable 18) is positive and significant, indicating that owners with many outlets fail less often than their smaller counterparts but that the benefits decrease as the owners possess more and more outlets and might even turn around at the extremes of chain size. Further, log distance to headquarters from outlet at risk (Variable 21) was strongly significant and positive, indicating that an owner's outlet is more likely to fail the more distant it is from the owner's headquarters location. Finally, we note that congenital experience (Variable 19), found to be significant for the pizza restaurant data in Kalnins and Mayer (2004), did not generalize to the drug stores and video rental outlets.

Comparison Test of Ownership Transfers and Exit-Entry Pairs in Contiguous Zip Codes. Model 3 includes two additional "comparison test" variables (C1 and C4). These variables record ownership transfers and exit-entry pairs that occurred in the zip codes contiguous to the multiunit owners' other zip codes. These variables help assess whether the owners can gain vicarious information not only in the immediate vicinity of their outlets but also over a broader area. The insignificant coefficients of C1 and C4 in Model 3 show that there is little benefit from transfers in contiguous zip codes. We confirm this formally with chi-square tests, shown at the bottom of the column for Model 3. The effects of transfers and exit-entry pairs in the same zip code as an owner's other outlets are significantly greater in absolute magnitude.

This finding suggests that information gained at outlets outside the immediate vicinity of the outlet at risk does not get transferred by the multiunit owners to their other markets. But the same-market controls, the ownership transfers and exit-entry pairs in the zip codes contiguous to that containing the outlet at risk, do decrease the outlet's likelihood of exit. So why should the turnover events have no effect when they are in the zip codes contiguous to those where multiunit owners operate other outlets? We speculate that the employees and managers of an outlet can pick up tacit knowledge across a wider geographic area, perhaps in the vicinity of their residences, that will benefit their home outlet. This information is less likely to be conveyed to the owner and even less likely to be subsequently transferred to outlets at a new location.

Falsification Tests Using Outlets of Single-Unit Owners. As we noted earlier, the outlets of single-unit owners, which necessarily had no outlets in other zip codes that could help them gather vicarious information, serve as a useful falsification test. We use them in Model 4 to assess the following possible confounding issue: Even though we have shown that outlets are less likely to fail when their owners have outlets in other zip codes with recent ownership transfers and exit-entry pairs, the possibility exists that the relationship is not causal. Perhaps, for example, shifting demographics or greater economic activity throughout a region cause both a high count of transfers as well as lower exit rates for all outlets across many zip codes, whether the outlets are multiunit or single-unit owned.

Model 4 reports the falsification test analysis. In this model, we assigned to all the outlets of single-unit owners the average counts of ownership transfers (Variable C1) and exit-entry pairs (Variable C4) experienced by the multiunit owners in their same zip at the same time. In other words, C1 and C4 are the equivalent of Variables 1 and 4. All multiunit owners receive values of zero for the falsification test Variables C1 and C4, while all single-unit owners have values of zero for main Variables 1 and 4 by definition because their owners have no other outlets where they can gather vicarious information. If the Variables C1 and C4 are significant in the same direction as Variables 1 and 4 and not significantly different in size, then we would not be able to refute the alternative possibility that regional economic or demographic effects are driving both the high number of transfers and exit-entry pairs and the lower exit rates.

As the results of Model 4 show, neither C1 nor C4 is significant in the same direction as the main Variables 1 and 4. Further, the chi-square tests at the bottom of the column for Model 4 that compare the magnitudes of Variables C1 to 1 and C4 to 4 show that the variables for the multiunit owners' outlets are significantly greater in magnitude than the falsification test variables. Sensitivity analyses found similar results when we used the maximum rather than the average value of the transfers and exit-entry pair variables for the multiunit owners in the same zip code when constructing Variables C1 and C4 for the single-unit owner outlets.

We also estimated regressions (not shown) that only include the outlets of single-unit owners. For this subpopulation, Variables C1 and C4 remain completely insignificant. We conclude that regional economic and demographic effects are not causing both the high values of the ownership transfer and exit-entry pair variables and the low exit rates.

Additional Robustness Tests. We conducted additional robustness tests. First, we split the Texan population into metropolitan (1,622 exits/3,671 outlets) and rural (1,903 exits/4,000 outlets) subpopulations. We defined

metro areas as the 10 most populous counties in Texas, which contain all the state's major cities. We found that Hypothesis 1, Hypothesis 3a, and Hypothesis 3b hold for the metro subpopulation, and Hypothesis 1, Hypothesis 2, and Hypothesis 3a hold for the rural subpopulation. The fact that Hypothesis 2 holds in the rural subpopulation, when it did not hold in the combined data, suggests that vicarious information from outlet transfers with name changes may be particularly valuable in more far-flung regions, where information sources may be weaker than in more extensively networked urban populations.

Second, we split the population into two periods, one from 1991 to 1994 (1,547 exits/4,994 outlets) and one from 1995 to 1999 (1,978 exits/5,440 outlets). For the first period, Hypothesis 1 and Hypothesis 3a were marginally supported, while for the second period Hypothesis 1, Hypothesis 3a, and Hypothesis 3b were supported.

Third, we analyzed the three industries separately. All coefficients had the expected signs, although significances varied somewhat.
- Drug stores (1,088 exits/2,355 outlets total): Hypothesis 2 and Hypothesis 3b were supported, while Hypothesis 1 and Hypothesis 3a were close to significant ($p < 0.20$).
- Pizza restaurants (949 exits/2,143 outlets total): Hypothesis 1 was supported, and the signs for all other coefficients were in the expected direction.
- Video rental stores (1,488 exits/2,693 outlets total): All coefficients had the expected signs, and Hypothesis 1 and Hypothesis 3a were close to significant ($p < 0.12$). We can only speculate about differences among the industries, but one possibility is that drug stores are a more complicated business than pizza and video rentals and that vicarious information is particularly valuable in helping owners to refine their activities. At the same time, we emphasize that all three industries contributed to the overall support for the hypotheses.

Fourth, we analyzed the exit of small franchisees, both by adding them to the subpopulation of independent owners and by treating them as a distinct subpopulation. The analyses in Table 2 excluded franchised outlets from the set of observations and from the independent variables. When we added the 1,703 outlets with 442 exits that were owned by small franchisees (using our criterion of 20 or fewer outlets owned), both as observations and to the count variables, our main results become stronger than those reported in Table 2. Further, when we analyzed the exits among only these 1,703 franchised outlets, including outlet counts of both franchised and nonfranchised small owners in the independent variables, we found support for Hypothesis 1 and Hypothesis 3a.

Finally, we are concerned that increasing market concentration in one of a multiunit owner's markets could lead to improved performance and even to a greater likelihood of survival of the owner's outlets in other markets. In other words, the owner may enjoy higher profitability as a result of the concentration and may then "buffer" the outlets in other markets, a la Miner et al. (1990). If this were true, our results might not come from vicarious information at all. Ownership transfers and exit-entry pairs could clearly increase concentration (e.g., Kim and Singal 1993). To rule out this possibility, we replaced Variables 1–7 with counts of transfers and exit-entry pairs where only single-unit owners were involved. In other words, we only counted as transfers cases where an owner sells his or her sole outlet to another owner who possesses no other outlets. In these cases, market concentration of the zip code does not change at all. Similarly, we counted only those excess exits, entries, and existing units owned by single-unit owners. We found support for Hypothesis 1, Hypothesis 3a, and Hypothesis 3b and conclude that changes in market concentration could not be generating our results.

Limitations
A limitation of a study such as this that demonstrates a relationship between a type of event (an ownership transfer or exit-entry pair) and an outcome (outlet exit) is that the study does not directly observe the causal role of any particular mechanism. We suggested two main mechanisms through which ownership transfers and exit-entry pairs could provide beneficial information to incumbent multiunit owners: information regarding changes in strategy that may have resulted in improved productivity or profitability, and specific information from personnel who left the employ of the transferred outlet. While we believe our strategy of studying the effect of ownership transfers in the vicinity of a multiunit firm's outlets in other markets on the likelihood of exit of an outlet in a given market isolated these mechanisms of vicarious information from other turnover-related mechanisms that may influence exit rates (e.g., changes in level of competition or signals of sufficient or insufficient demand), we cannot determine which mechanism played the greatest role, nor can we be certain that some other mechanism that we have failed to imagine could be affecting the results. Our interviews suggest that employee turnover may be the primary mechanism, but this is anecdotal evidence. Rigorous qualitative work that could distinguish the relative role of these mechanisms would be a very useful complement to this study.

Discussion and Conclusion
This study offers robust core results that some market turnover events are associated with a greater likelihood of survival of multiunit firms' outlets: Outlets of multiunit owners are less likely to exit if ownership transfers or contemporaneous exits and entries take place in the

vicinity of other outlets in different markets operated by the same multiunit owner as the outlet at risk. We developed the theory that vicarious information is the causal mechanism underlying this relationship. Our theory and results support the idea that market-level turnover events generate and release vicarious information into the local business environment.

We focused on ownership transfers and exit-entry pairs in other markets because they are market turnover events that are likely to generate and release vicarious information and because the informational mechanism is less likely to be confounded with other competitive dynamics. Potential vicarious learning benefits also exist for other market events such as exits (without entries in the same time period in the same market) and entries (without exits). For these cases, however, vicarious information may be confounded with other signals regarding demand provided to incumbent owners as well as any change in competitive intensity in the market.

We argued that ownership transfers and exit-entry pairs generate information by acting as real-world "natural experiments" from which proximately located outlets of the same industry can benefit. When outlets change hands, the new owner often pursued different operating strategies than the previous owner, hoping to improve performance. Owners of incumbent outlets in the vicinity can make inferences from such ownership transfers, which they can then apply in the operation of all their outlets. Owners can make similar inferences when exits and entries take place contemporaneously in the same market. They can view what a new outlet's owner is doing similarly and differently from the owner of the exited location.

Ownership transfers and exit-entry pairs also act as mechanisms to release information. Employees often switch jobs and work for competitors after transfers and exits. These employees can then take their information to their new employers, who, in turn, can pass the information along to other outlets that they own. Further, as we argued, ownership transfers at the retail and service outlet level are visible events. The transferred outlets often receive attention from the local business community, from reports of the transfer event in local business journals, from discussion within the networks of buyers and suppliers, or from the owners calling attention to themselves via an "under new management" banner. The attention also serves to release vicarious information into the local business environment.

The theory developed here and the supportive results that we present not only contribute to our understanding of organizational learning and knowledge transfer, but also suggest a basis for expanding the realm of population ecology and the turnover literature in economics. Those literatures have largely limited themselves to events within the same market or geographically contiguous markets. This paper has demonstrated how organizational learning-based arguments can be combined with our understanding of multiunit organizations to build a theory of relationships between turnover events even with large distances between them.

Endnotes

[1]Carroll and Hannan (2000) and Caves (1998) provide extensive reviews of the ecology and turnover literatures, respectively. The use of the term "turnover" originates from the Caves article, which defines turnover events as consisting of entries and exits, changes in market share, and changes in control (ownership transfers).

[2]Temporal autocorrelation within a market and spatial autocorrelation across contiguous markets are related issues. Exits may appear to beget exits within the same market, but this appearance may result from a regional shock that spans multiple periods. Studying effects of turnover events in markets not contiguous to that where the turnover event occurred minimizes these concerns as well.

References

Alchian, A. 1950. Uncertainty, evolution, and economic theory. *J. Political Econom.* **58** 211–221.

Almeida, P., B. Kogut. 1999. Localization of knowledge and the mobility of engineers in regional networks. *Management Sci.* **45** 905–917.

Argote, L. 1999. *Organizational Learning: Creating, Retaining, and Transferring Knowledge*. Kluwer Academic Publishers, Boston, MA.

Argote, L., E. Darr. 2001. Repositories of knowledge in franchise organizations: Individual, structural, and technological. G. Dosi, R. Nelson, S. Winter, eds. *The Nature and Dynamics of Organizational Capabilities*. Oxford Press, Oxford, UK, 51–78.

Baum, J., P. Ingram. 1998. Survival-enhancing learning in the Manhattan hotel industry, 1898–1990. *Management Sci.* **44** 996–1016.

Baum, J., H. Korn. 1996. Competitive dynamics of interfirm rivalry. *Acad. Management J.* **39** 255–281.

Bernardo, A., I. Welch. 2001. On the evolution of overconfidence and entrepreneurs. *J. Econom. Management Strategy* **10** 301–330.

Blossfeld, H., G. Rohwer. 1995. *Techniques of Event History Modeling: New Approaches to Causal Analysis*. Lawrence Erlbaum, Mahwah, NJ.

Bradach, J. 1998. *Franchise Organizations*. Harvard Business School Press, Cambridge, MA.

Bresnahan, T., P. Reiss. 1991. Entry and competition in concentrated markets. *J. Political Econom.* **99** 977–1009.

Brush, C. 1992. Marketplace information scanning activities of new manufacturing ventures. *J. Small Bus. Management* **30**(4) 41–53.

Camerer, C., D. Lovallo. 1999. Overconfidence and excess entry: An experimental approach. *Amer. Econom. Rev.* **89** 306–318.

Carroll, G., J. Delacroix. 1983. Organizational foundings: An ecological study of the newspaper industries of Argentina and Ireland. *Admin. Sci. Quart.* **28** 274–291.

Carroll, G., M. Hannan. 2000. *The Demography of Corporations and Industries*. Princeton University Press, Princeton, NJ.

Caves, R. 1998. Industrial organization and new findings on the turnover and mobility of firms. *J. Econom. Literature* **36** 1947–1982.

Chen, M., I. MacMillan. 1992. Nonresponse and delayed response to competitive moves: The roles of competitor dependence and action irreversibility. *Acad. Management J.* **35** 539–570.

Darr, E., L. Argote, D. Epple. 1995. The acquisition, transfer, and depreciation of knowledge in service organizations: Productivity in franchises. *Management Sci.* **41** 1750–1762.

Fann, G., L. Smeltzer. 1989. The use of information from and about competitors in small business management. *Entrepreneurship Theory Practice* **13**(4) 35–46.

Greve, H. 2002. An ecological theory of spatial evolution: Density dependence in the Tokyo banking industry, 1894–1936. *Soc. Forces* **80** 847–879.

Guo, G. 1993. Event-history analysis of left-truncated data. *Sociological Methodology* **23** 217–242.

Hartman, E., C. Tower, T. Sebora. 1994. Information sources and their relationship to organizational innovation in small businesses. *J. Small Bus. Management* **32**(1) 37–47.

Huber, G. 1991. Organizational learning: The contributing processes and literatures. *Organ. Sci.* **2** 88–115.

Ingram, P., J. Baum. 1997. Opportunity and constraint: Organizations' learning from the operating and competitive experience of industries. *Strategic Management J.* **18**(Summer Special Issue) 75–98.

Ingram, P., T. Simons. 2002. The transfer of experience in groups of organizations: Implications for performance and competition. *Management Sci.* **48** 1517–1533.

Johnson, J., R. Kuehn. 1987. The small business owner/manager's search for external information. *J. Small Bus. Management* **25**(3) 53–60.

Kale, P., J. Dyer, H. Singh. 2002. Alliance capability, stock market response and long term alliance success: The role of the alliance function. *Strategic Management J.* **23** 747–768.

Kalnins, A. 2005. Overestimation and venture survival: An empirical analysis of development commitments in international master franchising ventures. *J. Econom. Management Strategy* **14** 933–953.

Kalnins, A., K. Mayer. 2004. Franchising, ownership, and experience: A study of pizza restaurant survival. *Management Sci.* **50**(12) 1716–1728.

Kim, E., V. Singal. 1993. Mergers and market power: Evidence from the airline industry. *Amer. Econom. Rev.* **83** 549–569.

Kim, J. 2000. Crash test without dummies: A longitudinal study of interorganizational learning from failure experience in the U.S. commercial banking industry, 1984–1998. Unpublished doctoral dissertation, University of Wisconsin, Madison, WI.

Klepper, S., S. Sleeper. 2002. Entry by spinoffs. Mimeo, Carnegie Mellon University.

Knott, A. 2001. The dynamic value of hierarchy. *Management Sci.* **47** 430–448.

Levinthal, D., J. March. 1993. The myopia of learning. *Strategic Management J.* **14**(Winter Special Issue) 95–112.

McGrath, R., M. Chen, I. MacMillan. 1998. Multimarket maneuvering in uncertain spheres of influence: Resource diversion strategies. *Acad. Management Rev.* **23** 724–740.

McGuckin, R., S. Nguyen. 1995. On productivity and plant ownership change: New evidence from the longitudinal research database. *RAND J. Econom.* **26** 257–276.

Miner, A., P. Haunschild. 1995. Population level learning. B. Staw, L. Cummings, eds. *Research in Organizational Behavior*. JAI Press, Greenwich, CT, 1–23.

Miner, A., T. Amburgey, T. Stearns. 1990. Interorganizational linkages and population dynamics: Buffering and transformational shields. *Admin. Sci. Quart.* **35** 689–713.

Miner, A., J. Kim, I. Holzinger, P. Haunschild. 1999. Fruits of failure: Organizational failure and population-level learning. A. Miner, P. Anderson, eds. *Advances in Strategic Management*. JAI Press, Stamford, CT, 187–220.

Mitchell, W., J. Baum, J. Banaszak-Holl, W. Berta, D. Bowman. 2002. Opportunity and constraint: Chain-to-component transfer learning in multiunit chains of U.S. nursing homes, 1991–1997. N. Bontis, C. Choo, eds. *Strategic Management of Intellectual Capital and Organizational Knowledge*. Oxford University Press, New York, 555–574.

Nash, J. 1950. Equilibrium points in n-person games. *Proc. National Acad. Sci.* **36** 48–49.

Shaver, J., F. Flyer. 2000. Agglomeration economies, firm heterogeneity, and foreign direct investment in the United States. *Strategic Management J.* **21** 1175–1193.

Sorenson, O., P. Audia. 2000. The social structure of entrepreneurial activity: Geographic concentration of footwear production in the United States 1940–1989. *Amer. J. Sociology* **106** 224–262.

Sorenson, O., D. Waguespack. 2005. Social networks and exchange: Self-confirming dynamics in Hollywood. Mimeo, University of California at Los Angeles.

Stata Corp. 2001. *Stata 7 Reference Q–St.* Stata Press, College Station, TX.

Toivanen, O., Waterson, M. 2005. Market structure and entry: Where's the beef? *RAND J. Econom.* **35** 680–699.