FOREIGN ENTRY AND SURVIVAL: EFFECTS OF STRATEGIC CHOICES ON PERFORMANCE IN INTERNATIONAL MARKETS

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This paper investigates effective strategies that can reduce the risk of failure in international expansion by examining the entry and survival of foreign subsidiaries in the U.S. computer and pharmaceutical industries over the 1974–89 period. Using a hazard rate model, we examine the effects of (1) diversification strategies, (2) entry strategies, and (3) organizational learning and experience on the survival probabilities of foreign subsidiaries. The results show a higher exit rate for foreign acquisitions and joint ventures than for subsidiaries established through greenfield investments. The results also indicate a higher exit rate for subsidiaries that diversify than for those that stay in the parent firm's main product areas. Finally, the results show that firms benefit from learning and experience in foreign operations, which improves the chances of success for subsequent foreign investments. These findings shed light on the dynamic process of international expansion and the evolution of the multinational corporation.

A large body of academic research has focused on patterns of international expansion. However, most studies have focused exclusively on the firm-level factors that motivate the parent firm to initially pursue overseas investment; that is, the factors *leading to* international expansion. This stream of research originated with Hymer (1960), who concluded that foreign subsidiaries use internal, firm-specific advantages as a lever to enter, and compete in, foreign markets. Most scholarly work, after Hymer's seminal effort, has been devoted to pinning down the firm-specific advantages that drive international expansion. Although there are theoretical discussions in the literature, few empirical studies have addressed the issues of performance and survival of foreign subsidiaries *subsequent* to entry.

In international expansion, the firm builds on its initial investment and expands into new markets. The initial advantages identified by Hymer and others will be difficult to sustain without subsequent support through effective and ongoing strategic choices on the part of the firm. The present study demonstrates that specific strategic choices (diversification strategies and entry strategies) and firm characteristics (organizational learning and experience) result in different survival probabilities for foreign subsidiaries, and thus have a significant effect on performance in international markets. The major task of this paper is to investigate how these strategic choices and organizational factors affect the survival of foreign subsidiaries in the U.S.A.

For the purposes of this analysis, survival is defined as the continued presence of the foreign subsidiary in the U.S. host market, and failure as the subsidiary's exit. The performance implications of different strategic choices at the subsidiary level can be usefully explored by

examining the exit hazards of foreign subsidiaries. This study will use a hazard rate model to examine the survival of foreign subsidiaries in the U.S. computer and pharmaceutical industries over the 1974–89 period.[1] These analyses will shed light on our understanding of the dynamic process of international expansion and the evolution of the multinational firm. They will also offer managers who are considering international expansion information concerning the implications of strategic choices for the survival of foreign subsidiaries.

The paper is organized as follows. The next two sections review previous studies of international expansion, and develop hypotheses relating strategic choices and organizational characteristics to the survival of foreign firms in the U.S.A. The following section discusses models and variables for the study. The final sections discuss the empirical results, summarize major findings of this study and suggest areas for future research.

BACKGROUND

This section reviews previous studies on international expansion in order to identify key strategy variables which determine subsequent firm performance in international markets. Although a number of researchers have examined the factors behind international expansion, as mentioned earlier, few have addressed the subsequent survival of foreign subsidiaries (Wilson, 1980; Shapiro, 1983; Delacroix, 1993), or the effects of firm strategic choices on that survival.

Johanson and Vahlne (1977) explain international expansion as a process of knowledge development and incremental commitment. The basic assumption of their model is that lack of knowledge—resulting from differences in such areas as language and culture—is an important obstacle to effective decision-making in inter-

national operations. They argue that the necessary knowledge can only be gained through experience abroad. Increased knowledge can thus lead to effective strategic choices as part of an ongoing, dynamic process of incremental improvement in firm performance.

As a firm expands into international markets, one of the first major decisions is whether to continue in the same product areas or to diversify into unrelated ones. Although in some cases the decision to diversify into unrelated product areas may reflect a coherent international strategy on the part of the parent multinational corporation (MNC), it is generally a risky strategy (Caves, 1982). Bane and Neubauer (1981), examining the role of diversification in the failure of new foreign manufacturing activities among 69 large European MNCs, found that subsidiaries often failed upon undertaking unrelated diversification outside their home countries. It is clear from these and other studies that diversification strategy is a critical variable that will affect the performance and survival of foreign subsidiaries.

Similarly, the firm's foreign entry strategy, in the form of establishing a new subsidiary (greenfield investment), creating a joint venture with another firm, or acquiring an existing company, is an important decision for both multinational and domestic firms. Surprisingly, little attention has been paid to the performance implications of entry choices. However, the few studies that have touched on this issue have shown that the choice of an appropriate entry strategy is a critical determinant of the likely success of the foreign operations (Root, 1987). For example, Wilson (1980), using the data base from the Harvard Multinational Enterprise Project, concludes that subsidiaries newly established by the parent company are less likely to be divested than those acquired from other firms. Delacroix (1993), employing a hazard rate model on the same data base, reaches the same conclusion. These studies suggest that entry choices will significantly affect the performance and survival of foreign subsidiaries.

A recent study by Mitchell, Shaver and Yeung (1992) examines the effect of increasing and decreasing international presence upon the performance of the *parent* multinational firm. The study found that in the medical diagnostic imaging equipment industry, attempting to become an international player is risky for the parent firm;

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[1] A firm is considered a foreign subsidiary when 10 percent or more of the firm's equity is controlled by a foreign parent (U.S. Department of Commerce, 1985–90). Data on the financial structure of U.S. affiliates of foreign firms in 1986 show that, on average, the foreign parents controlled 80.2 percent of the affiliates' equity (Graham and Krugman, 1989). Thus, the typical U.S. affiliate of a foreign firm is clearly majority owned, rather than an ambiguous case in which the foreign firm holds a fractional stake.

both increasing and decreasing international presence can have negative associations with the survival of the parent firm. The focus of the present paper, however, will be on how different international strategies affect the survival of foreign subsidiaries, rather than on the survival of the parent firm.

First-time investors and firms with considerable previous experience may differ in their motivations for international expansion, the implementation of expansion strategies, and the effectiveness of these strategies (Kogut, 1983). As Davidson (1980) has shown, knowledge of and experience in the target market are critical to international expansion, with firms more likely to invest where they or their competitors in the same industry have invested before. The importance of learning and experience in international expansion and operation has been explored in a number of previous studies (e.g., Johanson and Vahlne, 1977; Wilson, 1980; Kogut and Singh, 1988; Hennart, 1991). These studies suggest that organizational learning and experience can have significant effects on the performance of foreign subsidiaries.

This paper contends that certain strategies can be used to reduce the risks of international expansion, and thereby can lead to better performance and longer survival for foreign subsidiaries. The above review suggests that diversification strategy, entry strategy and organizational learning and experience are critical factors determining performance in international markets. In the next section specific hypotheses will be developed to link these strategies to the survival of foreign subsidiaries.

HYPOTHESES

Building on the previous sections, we examine the effects of product diversification strategy, entry strategy, and organizational learning and experience on the exit rates of foreign subsidiaries. The hypotheses are developed based on received theories in the international strategy literature.

Diversification strategy

The product line of a new foreign subsidiary may be different from the parent MNC's established activities. The more remote the business of the new subsidiary from the core product areas of the parent activities, the greater is the uncertainty involved (Caves, 1982). This has important implications for the performance of foreign subsidiaries.

The relationship between product diversification and firm performance has been a subject of considerable research in the strategy literature (Wrigley, 1970; Rumelt, 1974; Montgomery, 1982). Rumelt (1974), for example, has found that firm diversification into related, rather than unrelated, fields has a positive effect on firm performance. However, empirical findings of the effect of relatedness on performance are inconclusive (e.g., Ramanujam and Varadarajan, 1989). These mixed findings may be due to differences in the diversification and performance measures used, and also inconsistencies in the research design.

In general, when foreign firms expand abroad in the same product areas, the parent firm is more likely to possess skills, resources, and intangible assets that can be utilized in the new subsidiaries. Because the parent firms tend to export to a foreign country before setting up a subsidiary there, the new subsidiary may also benefit from pre-existing relations with customers and distribution channels in the host market, which have been previously developed by the parent company (Newbound, Buckley and Turwell, 1978). These pre-existing relationships will work to reduce uncertainty for the new subsidiary in the host market.

When firms expand abroad through product diversification, however, the new foreign subsidiary is more likely to encounter difficulties. The complex uncertainties of unfamiliar market conditions and unfamiliar products and technology are likely to increase the exit hazards of foreign subsidiaries. This higher risk of product diversification in the international market has been noted in previous studies. Bane and Neubauer (1981), for example, examine the effect of product diversification on the failure of new foreign activities and suggest that diversifying into a different product area in a foreign market increases the hazard of failure. The first hypothesis will examine the relationship between product diversification and the exit hazard of foreign subsidiaries.

Hypothesis 1: Foreign subsidiaries which

diversify into different product areas from the parent firms are more likely to exit than those remaining in the same product groups.

Entry strategy

The choice of entry strategy—whether through acquisition, joint venture, or greenfield investment—is related to the survival of foreign subsidiaries because these strategies differ both in expected riskiness and in the importance of various coordination costs.[2] It is widely assumed that the acquisition of an existing firm in a host market will reduce the risk of uncertainty for foreign firms. Many believe that, in contrast to greenfield investment, foreign entries through acquisitions should be able to rely on pre-existing relationships with suppliers and customers, and the expertise of existing personnel familiar with the local market conditions (Caves, 1982: 81–82). Because of these factors, it is often assumed that the survival rate of subsidiaries founded by acquisition will exceed that of newly founded subsidiaries. However, several previous studies using data from the Harvard Multinational Enterprise Project show the opposite: foreign subsidiaries of U.S. MNCs founded by acquisitions have a higher rate of exit than those founded as new ventures (Wilson, 1980; Delacroix, 1993).

The higher exit hazards associated with acquisitions may be related to the difficulties of integrating acquisitions into the parent system (Jemison and Sitkin, 1986). Prior research on acquisitions has only partially addressed the question of why so many well-intended and well-advised acquisition efforts result in disappointing outcomes. Because of different corporate cultures, organizational structures, and technology, integrating the acquired firm into the parent system presents formidable challenges. The difficulty in integration often leads to inferior

performance and the subsequent failure of the acquired subsidiaries (Wilson, 1980; Caves, 1982).

Another factor affecting the higher hazards of acquisitions seems to be the degree of attachment between the managers of the foreign subsidiary and the parent firm. As Wilson (1980) observes, managers are often reluctant to divest organizations which they have themselves created. For greenfield investments, this will result in a stronger managerial attachment between managers of the parent firm and the foreign subsidiary. Because the foreign subsidiary may have to rely on the parent firm for financial resources, technology, and markets, the attachment between managers of the parent firm and the foreign subsidiary is important for the survival of the foreign subsidiary.[3] In contrast, such managerial attachment with an acquired subsidiary may take time to build.

Therefore, in contrast to greenfield investment, a higher exit rate may result for acquisitions because of weak managerial attachment and difficulty in integration. The managerial attachment between parent and subsidiary managers is greater in the case of a greenfield investment; difficulties of integrating acquired subsidiaries may often offset, or even exceed, the benefits of acquisitions in reducing uncertainty in foreign markets.[4] This leads to the prediction of the next hypothesis.

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[2] Foreign acquisition is defined as the purchase of stock in an already existing company in an amount sufficient to confer control. A greenfield investment is a start-up investment in new facilities. Following Kogut and Singh (1988), this study classifies all start-up investments which are wholly owned under greenfield and those which involve shared ownership under joint venture. A joint venture is both legally and conceptually different from a minority equity participation investment, where a firm invests directly into a second company but does not share control with a third party.

[3] As noted earlier, our focus in this paper is on the survival of foreign subsidiaries. While survival can be an indicator of the subsidiary performance over time, better measures of subsidiary performance should be examined in future research. The paper also does not address the issue of parent firm performance. For example, subsidiary survival due to strong managerial attachment may not necessarily have a positive effect on the performance of the parent firm. In other words, decreased managerial attachment may have benefits because it may lead the parent firm managers to make more objective decisions regarding the fate of the subsidiary. This research question is left to a further study.

[4] Because the main focus of this paper is to examine how different entry strategies, once formulated and implemented, affect subsequent survival, we do not examine in this study how these entry decisions are made; that is, what factors lead to the choice of an entry strategy such as acquisition rather than greenfield investment. But these factors may also have impacts on the subsequent exit hazard of the subsidiary. For example, if there is evidence to suggest that acquisition strategy tends to be formulated less well than the greenfield strategy, this might contribute to the observed higher exit hazards for acquisitions. Thus the observed exit hazard is the consequence of problems in the formulation of the entry decision as well as in implementation of the entry strategy.

A recent study by Fichman and Levinthal (1991) has examined the 'honeymoon effect' and organizational commit-

Hypothesis 2: Foreign firms entering through acquisitions are more likely to exit than those entering through greenfield investments.

Acquisition and greenfield can be considered as representing alternative entry strategies. However, both acquisition and greenfield investment can take the form of a joint venture as well (Caves and Mehra, 1986). A joint venture is the pooling of assets into a common but separate organization by two or more firms which share joint ownership and control (Kogut, 1988). In this study joint venture is treated as a separate entry strategy because it possesses unique characteristics that affect business failures. For example, in contrast to acquisitions, joint ventures frequently assign management tasks to local partners who are better qualified than home country individuals to manage the local labor force and relationships with suppliers, buyers, and governments.[5] A joint venture, however, may be troubled not only by cultural differences between the partners, but also by difficulties in sharing proprietary assets. A wholly owned greenfield investment avoids both the costs of integration, as well as conflict over sharing proprietary assets, by imposing the management style of the investing firm on the start-up, while at the same time preserving full ownership (Kogut and Singh, 1988). The above analysis suggests a higher exit hazard for joint ventures when compared to greenfield investments.

Hypothesis 3: Foreign firms entering through joint ventures are more likely to exit than those entering through greenfield investments.

Organizational learning and experience

First-time investors in the U.S. market are likely to face high information costs and considerable uncertainty. If the investment is to be viable,

channels must be established to customers, suppliers and other elements of the foreign industrial environment. Previous experience with foreign investment directly affects the parent's stock of experience in establishing and managing foreign subsidiaries. Previous studies have shown that international expansion processes of MNCs entail taking the small steps first, thereby gaining knowledge useful for more remote ventures (Johanson and Vahlne, 1977). Newbound *et al.* (1978) argue that small British MNCs are more successful in foreign investments if the companies precede those investments with other activities that give them familiarity with foreign markets. Similarly, Davidson (1980) observes that U.S. MNCs expand abroad by a sequence of steps that take them from familiar and nearby foreign markets to unfamiliar and more distant ones. Wilson (1980) confirms that the previous experience of the parent firm affects the likelihood of divestment of foreign subsidiaries.

When an MNC makes a first-time direct investment in a new market, the structure may not have been set up to facilitate communications between the new subsidiary and the foreign parent. In subsequent investments, the parent can benefit from learning and experiences gained during its previous foreign operations and build upon the existing network of foreign value-added activities (Kogut, 1983). Established MNCs and first-time investors are influenced by different variables in their foreign investment decisions, with the benefits of learning reflected in the decisions of more experienced firms.[6] Thus we would expect that a subsidiary which is the first-time investment in the U.S.A. by a foreign parent is more likely to exit than subsequent

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ments. Their study suggests that stronger commitments imply a longer honeymoon period. Therefore the honeymoon period may differ for greenfield and acquisition entries because of differences in parent commitment. The arguments on managerial attachment and integration difficulties are related to the parent commitment, but future research is needed to explore this issue further.

[5] Since acquisitions are shown to be difficult to manage when cultural differences are high, joint ventures tend to be used in such cases (Kogut and Singh, 1988). Thus joint ventures are often used as an intermediate strategy. Recent research

has examined joint ventures as an option for firms to acquire and expand (Kogut, 1989).

[6] This paper does not explore all of the complexities in organizational learning. For example, we examine only whether a subsidiary is a first-time investment by a foreign parent in the U.S.A., not the sequence of entries made by the same parent company. A company, however, might learn from a number of failed joint ventures and use that experience in establishing a successful greenfield venture. In this case, one might expect a pattern of failure of joint ventures and lack of failure in greenfield investments if 'failed' joint ventures are a stepping stone to successful greenfield ventures. For example, about 70 percent of subsidiaries in the sample were not first-time investments by foreign parent firms and were thus multiple entries by foreign parents. Further research is needed to explore such complexities in organizational learning.

investments. The following hypothesis examines the effects of learning and experience on the exit hazard of foreign subsidiaries.

Hypothesis 4: The first-time investments by foreign parents in a new market are more likely to exit than subsequent foreign direct investments.

DATA AND RESEARCH DESIGN

Foreign firms in the U.S. computer and pharmaceutical industries

The empirial study concentrates on foreign firms in the U.S. computer and pharmaceutical industries over the 1974–89 period. Foreign investment in the U.S. computer industry has been increasing rapidly during the last decade. Many cash-poor American computer start-ups that had difficulty obtaining financing from domestic sources often sought out foreign investors to remain in business and to underwrite R&D efforts (Teece, 1992). In the past several years, the Japanese have been active investors in the U.S. market. During 1987, for example, they acquired investment positions in five U.S. computer firms and opened eight new plants. The foreign firms' share of total U.S. employment in the computer industry increased from 4.1 percent in 1980 to 9.3 percent in 1988 (U.S. Department of Commerce, 1991).

The foreign presence in the U.S. pharmaceutical industry has historically been dominated by firms from a few home countries. In 1975, for example, three Swiss firms (Hoffman-La Roche, Ciba-Geigy, and Sandoz) and one British firm (Burroughs-Wellcome) were responsible for over 75 percent of all U.S. sales by foreign firms. All four firms maintain an extensive research capacity in the U.S.A. that is comparable to that maintained in the home country. Foreign firms' share of total sales in the U.S. pharmaceutical industry increased from 14.5 percent in 1980 to 25 percent in 1988 (U.S. Department of Commerce, 1991). The internationalization of the pharmaceutical industry has proceeded largely through foreign direct investment (FDI). The servicing of foreign markets through exports is hampered by high tariffs as well as non-tariff barriers, such as the reluctance of the U.S. Food and Drug Adsministration (FDA) to

accept any foreign clinical data on product safety and efficacy (Burstall, Dunning and Lake, 1981). Because of the high costs of discovering new drugs and developing them into marketable products, pharmaceutical firms derive their competitive advantage from the exercise of their ownership rights over the technology embodied in the new products (U.S. Department of Commerce, 1985).[7]

Data

The sample consists of the life histories of all foreign firms entering the U.S. market between 1974 and 1989 in the computer and pharmaceutical industries. This research design requires complete data on both entry and exit for all foreign firms in the sample. Data on new entries of foreign firms were collected from documents of the U.S. Department of Commerce (DOC), which began collecting entry data of FDI in the U.S.A. in 1974 (U.S. Department of Commerce, 1985–90). Tracking down the life histories (or exits) of foreign subsidiaries entered since 1974 required extensive data-collecting efforts.

Exit occurs when a firm no longer exists as a U.S. subsidiary of the same foreign parent(s). Foreign firms can exit through: (1) bankruptcy and liquidation; (2) closure; (3) divestiture (e.g., acquisition by U.S. firms). Because the data do not allow us to discriminate between these different exit forms, the present study focuses on overall exit probabilities. However, for this reason caution is advised in interpreting the results. Future research is needed to explore the competing risks of different exit forms.

Multiple data sources were used to track down the life histories of the sample firms. We first checked the sample firms with the four editions of *Directory of Foreign Manufacturers in the United States* (Arpan and Ricks, 1974–90). Foreign firms still in operation in 1989 are coded as right censored, and those not in

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[7] Both the pharmaceutical and computer industries have distinct market segments. In the pharmaceutical industry, for example, there are three product areas: (1) ethical or prescription drugs; (2) non-prescription/over-the-counter drugs; and (3) generic drugs (U.S. Department of Commerce, 1985). Because firm-level data on market segments are not available, several variables such as dummy variables for firms entered before 1978 are included in the model to control for major changes in the market segments. Caution is advised, however, in interpreting the results.

Table 1. Entry and exit of foreign subsidiaries in the U.S. computer and pharmaceutical industries: 1974–88

	Number of foreign subsidiaries					
	Computer			Pharmaceutical		
Year	Entry	Exit	At risk	Entry	Exit	At risk
1974	1	0	1	2	0	2
1975	2	0	3	4	0	6
1976	5	1	7	2	0	8
1977	3	0	10	9	4	17
1978	9	1	18	10	2	23
1979	11	1	28	7	1	28
1980	10	2	36	5	4	32
1981	7	2	41	12	4	40
1982	5	2	44	13	1	49
1983	15	6	53	9	6	57
1984	8	6	55	7	5	58
1985	13	4	64	7	3	60
1986	21	9	78	11	8	68
1987	23	4	97	4	3	64
1988	20	2	115	12	1	73
Total	153	40	650	114	42	585

Note: At risk—the number of foreign subsidiaries at risk of exit each year.

operation in 1989 as having exited during the 1974–89 period. We then examined the exact year of exit for each firm with *Who Owns Whom* (various years).[8] Firms not identified by *Who Owns Whom* were checked with other data sources such as *International Directory of Corporate Affiliations* (various years), *Directory of Japanese Manufacturers in the United States* (Japan Economic Institute, 1987–89) and related industry directories. In the case of bankruptcy filing, exit was coded as the time of bankruptcy. Care was taken through extensive cross-checking to exclude events such as name changes or reorganizations from the data set. The total number of foreign entries in the two industries during the 1974–88 period was 267, including 153 foreign computer subsidiaries and 114 pharmaceutical subsidiaries (Table 1). Among the 267 firms, 82 exited during the 1974–88 period, including 40 foreign computer

[8] When the name of a foreign subsidiary disappears from listings in *Who Owns Whom*, the subsidiary is coded as exit. In some cases, *Who Owns Whom* listed subsidiaries as inactive. These subsidiaries were coded as exits because their functions were discontinued, and they would have been formally dissolved if they were independent firms.

subsidiaries and 42 pharmaceutical subsidiaries. Breaking each foreign subsidiary's duration into yearly records generates 1235 firm-year records for the overall sample: 650 for the computer subsample and 585 for the pharmaceutical subsample. Table 1 shows the data on foreign entries and exits in these two industries. Table 2 lists hazard rates by age for foreign subsidiaries.

Event-history method

This study uses an event-history analysis to examine the effects of firm strategic choices and organizational characteristics on the exit rate of foreign firms in the U.S.A. An event history is a longitudinal record of events occurring among a sample of firms (Allison, 1984). A central concept in event-history analysis is the risk set, defined as the set of firms at risk of a given event (e.g., entry, exit) at a given point in time. The risk set in this study is the number of foreign firms in a U.S. industry which are at risk of exit at each point in time. The second key concept is the hazard (or exit) rate. In this study, the hazard rate is defined as the probability of exit

Table 2.   Exit hazard rates of foreign subsidiaries in the U.S. computer and pharmaceutical industries: 1974–88

	Computer industry			Pharmaceutical industry		
Subsidiary	Exits	At risk	Exit rate (%)	Exits	At risk	Exit rate (%)
1	13	153	8.50	3	114	2.63
2	6	120	5.00	11	100	11.00
3	5	88	5.68	9	85	10.59
4	4	69	5.80	12	65	18.46
5	2	55	3.64	3	51	5.88
6	3	47	6.38	2	46	4.35
7	2	37	5.41	1	38	2.63
>7	5	81	6.17	1	86	1.16
Total	40	650		42	585	

Note: Hazard rate is at the ratio of exited subsidiaries (Exits) to all subsidiaries which survive to that age (At risk).

within a particular year for those foreign firms in the U.S.A. that are at risk that year.[9]

The empirical analysis uses an event-history logistic regression model. To incorporate the effect of environmental variables that change over time, we break each foreign subsidiary's duration into a set of firm-year records (Allison, 1984). We then associate with each yearly record the appropriate time-varying variables at the beginning of each year. The literature does not provide us with an *a priori* theoretical proposition as to the time specification of the exit rate of foreign subsidiaries. Rather than assuming any particular parametric specification, this study controls the age effect by incorporating foreign subsidiary age in the models.[10]

We estimate the logistic regression model

using maximum likelihood methods. The binary dependent variable, *Exit*, takes the value of '1' if a foreign subsidiary exited during a particular year and '0' otherwise.

Variables

The independent variables are operationalized below. The descriptive statistics and correlation matrix for the overall sample as well as each industry are included in the Appendix.

1. *Diversification strategy*. We compare the product line of each subsidiary with the major product categories of its parent firm, using data from the *International Directory of Corporate Affiliations*. The dummy variable, *Diversification*, is '1' if the product line of a subsidiary differs from its foreign parent's major product areas at the four-digit SIC level, and '0' otherwise. Because the data source only lists the major product categories of the parent company, our coding of the subsidiary diversification only measures whether the foreign subsidiary is in the major areas of the parent firm. This can be seen as an indication of whether the subsidiary is in the core areas of the parent firm. Twenty-one percent of subsidiaries in the sample diversified into areas that differ from the parent firms' activities.

2. *Entry strategy*. We created two dummy variables to compare acquisitions and joint ven-

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[9] Formally, the hazard rate is defined as:

$$\gamma(t) = \lim_{\Delta t \to 0} \frac{\Pr[\text{exit } (t,t + \Delta t)|\text{alive at } t]}{\Delta t}$$

where Pr[.] gives the probability that a foreign firm will exit between t and $t + \Delta t$, and $\gamma(t)$ gives the instantaneous exit rate of a foreign subsidiary at age t. Because of the date limitation, a discrete time event-history analysis is used in this study.

[10] There are both parametric and nonparametric methods in event history analyses. Nonparametric methods make few if any assumptions about the distribution of event times (e.g., the partial likelihood model). Parametric methods assume that the time until an event or times between events come from very specific distribution families, the most common being the exponential, Weibull and Gompertz distributions (Allison, 1984; Hannan and Freeman, 1989).

tures with greenfield investments. The variable *Acquisition* takes the value of '1' for an acquisition entry and '0' otherwise. The variable *Joint venture* takes a value of '1' for joint ventures. Data were collected from the DOC documents (U.S. Department of Commerce, 1985–90). Among the sample firms, 62 percent entered through acquisitions, 7 percent entered through joint ventures, and the remaining 31 percent entered through greenfield investments.

3. *Organizational learning and experience.* We use two variables to examine the effects of organizational learning and experience on the exit rate of foreign subsidiaries. We first examine whether the subsidiary is the first-time direct investment in the U.S.A. by a foreign parent or is a subsequent investment. The variable *Experience* is '0' if the subsidiary is the first-time investment in the U.S.A. by a foreign parent and '1' otherwise. Thirty percent of the subsidiaries in the sample were the first-time investments in the U.S.A. by their parent firms. Data were collected from *Who Owns Whom*. A second variable, *Additional investment*, is used to measure continued commitment from the parent company in the existing subsidiary. It is measured by the number of investments in addition to the initial investment by the foreign parent in the existing subsidiary over the sample period.

4. *Control variables.* Studies have shown that firm size has an important effect on exit rates (Freeman, Carroll and Hannan, 1983). Smaller firms are more likely to fail than large firms. We collected data on the subsidiary size from the DOC documents. Investment values less than $0.5 million are not given in the DOC documents, thus a continuous variable on subsidiary size is not available. Based on the size distribution, we created two dummy variables to control for the effects of subsidiary size: one dummy for subsidiaries with sales over $0.5 million but not over $5 million and the other for those with sales over $5 million. Both these subsidiary size dummies are compared to subsidiaries with sales less than $0.5 million in the model.[11]

To control for the time dependence of exit rates, we included subsidiary age in the model. To estimate the effects of environmental richness, we included industry growth and concentration in the models. Data on the annual growth rate of industry shipment were obtained from the DOC documents. The degree of industry concentration will also influence the competitive behavior of entrants, and industries that are concentrated are likely to be characterized by a high degree of interdependence. Data on industry concentration (four-firm concentration ratios) were obtained from the Census of Manufacturing (1972, 1977, 1982, 1987). Data for non-census years are intra-plotted.

We included an industry dummy variable, *Pharmaceutical*, in the overall models to control for industry differences. The dummy variable takes a value of '1' for all pharmaceutical subsidiaries. The nationality of foreign subsidiaries may also affect the exit hazard rate. There may be differences among countries in the international expansion strategies of their MNCs (Kogut and Singh, 1988). Based on the distribution of foreign subsidiaries by country of origin and suggestions from the literature, a country dummy, *Japan*, is included in the model to explore the effect of home country influences. The dummy variable takes a value of '1' for Japanese subsidiaries. For each industry, we included a dummy variable for time to indicate major changes in that industry. For the computer industry, we coded firms entered before 1978 as '1' to control for the emergence of the personal computer segment. For the pharmaceutical industry, we included a dummy for firms entered before 1978 to measure the effects of regulatory changes that affected the ability and speed with which firms obtained patents in this industry (Comanor, 1986).

RESULTS

The model estimates for the overall sample, as well as separate analyses for foreign firms in the

[11] The parent firm size may also affect the exit rate of foreign subsidiaries. Continuous variables were not available for parent firms because some were very small. We created

two dummy variables to control for the parent firm size: one dummy for parent firms with sales over $0.5 billion but not over $5 billion and the other for parent firms with sales over $5 billion. Data were collected from the *International Directory of Corporate Affiliations*.

Table 3.   Exit rate models of foreign subsidiaries in the U.S.A.: Logistic regression results

Variables	Models		
	(1)	(2)	(3)
Subsidiary age	0.3444*	0.3212*	0.6494***
	(0.1870)	(0.1902)	(0.2106)
Age square	−0.0412**	−0.0417**	−0.0686***
	(0.0203)	(0.0207)	(0.0226)
Subsidiary size			
$0.5 mil. < sales < $5 mil.	−0.6416*	−0.6177*	−0.9244**
	(0.3278)	(0.3355)	(0.3704)
Sales > $5 million	−0.5850**	−0.5878**	−0.8440***
	(0.2772)	(0.2817)	(0.3136)
Parent size			
$0.5 bil. < sales < $5 bil.	−0.1363	0.0447	0.2904
	(0.2593)	(0.2740)	(0.3509)
Sales > $5 billion	−1.3366***	−1.2649***	−0.3482
	(0.3480)	(0.3519)	(0.4431)
Industry concentration		−0.0511	−0.1675
		(0.0974)	(0.1094)
Industry growth		−2.2125	−3.6140**
		(1.7545)	(1.8398)
Pharmaceutical		−1.0611	−3.3398
		(1.9261)	(2.1568)
Japan		−1.2806***	−0.6736
		(0.4118)	(0.4523)
Diversification			1.7314***
			(0.2720)
Acquisition			1.6781***
			(0.5014)
Joint venture			1.8091***
			(0.6655)
Experience			−0.6013*
			(0.3227)
Additional investment			−0.8289**
			(0.3759)
Firm-year records	1235	1235	1235
Number of exits	82	82	82
Hit ratio (%)	68.9	72.6	84.7
Log likelihood	−563.4	−549.9	−461.9
Chi-square		13.5***	88.0***
(Degrees of freedom)		(4)[a]	(5)[b]

***$p < 0.01$; **$p < 0.05$; *$p < 0.10$. Standard errors are in parentheses.
[a]Compared to Model 1; [b]Compared to Model 2.

U.S. computer and pharmaceutical industries, are reported in Tables 3–5. In each table we report the results of three logistic regression models. A positive sign means that the variable increases the likelihood of subsidiary exit. The first model contains the effects of subsidiary age and the size of both the parent and the subsidiary. The second model adds on the effects of industry structure and environmental variables such as industry concentration and annual rate of industry

Table 4. Exit rate models of foreign subsidiaries in the U.S. computer industry: Logistic regression results

Variables	Models		
	(1)	(2)	(3)
Subsidiary age	−0.0109 (0.0640)	−0.1415* (0.0825)	0.0452 (0.0940)
Subsidiary size			
$0.5 mil. < sales < $5 mil.	−0.7343 (0.4633)	−0.7599* (0.4692)	−1.4247** (0.5606)
Sales > $5 million	−0.5896 (0.3853)	−0.5711 (0.3931)	−0.6967 (0.4589)
Parent size			
$0.5 bil. < sales < $5 bil.	−0.0861 (0.3851)	−0.2819 (0.4458)	0.7767 (0.6024)
Sales > $5 billion	−1.2688*** (0.4493)	−1.1768** (0.4630)	0.3712 (0.6275)
Industry concentration		−0.4095** (0.1953)	−0.5169** (0.2230)
Industry growth		−4.9923** (2.1822)	−6.4234** (2.5467)
Entry before 1978		1.2037** (0.5414)	0.9418 (0.7092)
Japan		−0.8148 (0.5123)	−0.0304 (0.6042)
Diversification			2.3625*** (0.4362)
Acquisition			2.1331*** (0.8132)
Experience			−2.2138*** (0.5700)
Additional investment			−0.8328** (0.4159)
Firm-year records	650	650	650
Number of exits	40	40	40
Hit ratio (%)	64.6	74.3	89.1
Log likelihood	−285.2	−271.2	−203.3
Chi-square		14.0***	67.9***
(Degrees of freedom)		(4)[a]	(4)[b]

***$p < 0.01$; **$p < 0.05$; *$p < 0.10$. Standard errors are in pathentheses.
[a]Compared to Model 1; [b]Compared to Model 2.

growth. The third model adds on the effects of strategy variables. Because these are nested models, the chi-square tests of corresponding models show that each model improves significantly on the previous model. The results clearly demonstrate the importance of strategy variables to the survival of foreign subsidiaries. The full model correctly predicts 85 percent of foreign subsidiary exits in these two industries.

In the rest of this section, we will report maximum likelihood estimates of the effects of firm strategic choices and organizational characteristics on the exit hazard of foreign firms in the U.S.A. The discussion will focus on the three main variables associated with diversification strategies, entry strategies, and organizational experience. The effects of control variables will also be discussed.

Table 5. Exit rate models of foreign subsidiaries in the U.S. pharmaceutical industry: Logistic regression results

Variables	Models		
	(1)	(2)	(3)
Subsidiary age	1.1481***	1.1881***	1.5070***
	(0.3907)	(0.3906)	(0.4170)
Age square	−0.1459***	−0.1513***	−0.1749***
	(0.0496)	(0.0493)	(0.0513)
Subsidiary size			
$0.5 mil. < sales < $5 mil.	−0.4655		
	(0.4796)		
Sales > $5 million	−0.5410	−0.3414	−0.6179
	(0.4143)	(0.4142)	(0.4610)
Parent size			
$0.5 bil. < sales < $5 bil.	−0.1639		
	(0.3690)		
Sales > $5 billion	−1.4426***	−1.6656***	−0.6115
	(0.5526)	(0.5097)	(0.6035)
Industry concentration		−0.0855	−0.1172
		(0.1378)	(0.1448)
Industry growth		−1.3841	−0.0939
		(6.8141)	(7.2908)
Entry before 1978		0.5819	−0.1136
		(0.4221)	(0.4773)
Japan		−1.8077**	1.3084*
		(0.7487)	(0.7888)
Diversification			1.5020***
			(0.4424)
Acquisition			1.3401**
			(0.6712)
Joint venture			1.5870**
			(0.7824)
Experience			−0.0813
			(0.4154)
Additional investment			−1.7814*
			(1.0317)
Firm-year records	585	585	585
Number of exits	42	42	42
Hit ratio (%)	74.6	78.7	85.9
Log likelihood	−268.6	−257.3	−225.7
Chi-square			31.6***
(Degrees of freedom)			(5)[a]

***$p < 0.01$; **$p < 0.05$; *$p < 0.10$. Standard errors are in parentheses.
[a]Compared to Model 2.

Diversification strategy, our first main variable, is found to have a significant effect on the survival of foreign subsidiaries. Diversifying into unrelated product areas abroad increases the exit hazard of foreign subsidiaries. This result is strongly supported in both the overall analysis and in the industry-specific analyses for the U.S. computer and pharmaceutical industries. The result is also consistent with previous findings (Bane and Neubauer, 1981).

With regard to the second variable, entry strategies, the study explored the different

hazards of exit associated with three types of strategies: acquisition, joint venture, and greenfield investment. In the hazard rate model, foreign entries through acquisitions and joint ventures are compared to greenfield investments. The results show that foreign acquisitions are more likely to exit than greenfield investments. The result is significant for both the overall and the industry-specific samples. These results are consistent with previous findings for U.S. direct investment abroad (Wilson, 1980; Delacroix, 1993). The results also show that joint ventures are more likely to exit than entries through greenfield investments in the pharmaceutical industry as well as in the overall sample.[12]

The third variable, organizational experience, was examined using first-time investment and additional investment to measure the effects of organizational learning and experience upon the exit rates of foreign subsidiaries. The results show that first-time investment has a higher exit hazard than subsequent foreign investments in the computer industry. This factor, however, was not significant for subsidiaries of pharmaceutical firms, possibly because of firm-specific advantages such as patents, and government regulations in the pharmaceutical industry. Examination of additional investment, used to measure the continuing commitment from the parent company in the existing subsidiary, shows that subsidiaries with continued commitment from the parent companies are less likely to exit.

Controls

We also controlled for the effects of industry growth and industry concentration and found that both had a positive effect on subsidiary survival in the computer industry. It seems clear that firms are less likely to exit from a growing market, and they are also less likely to exit from a concentrated industry. Neither industry growth nor concentration, however, proved to be significant for the pharmaceutical sample. This suggests important differences across the two industries we studied. The dummy variables for firms which

entered before 1978 did not show significant effects upon exit rates of foreign subsidiaries for either industry during the observation period.

The results show that the nationality of foreign subsidiaries also affects the exit rate. In the pharmaceutical industries, subsidiaries of Japanese companies were found to be less likely to exit than subsidiaries of other foreign countries (Model 2). But once we added firm-level strategy variables into the model (Model 3), the sign of the country dummy variable changed and Japanese subsidiaries were shown to be more likely to exit than other subsidiaries (at a reduced significance level). The results confirm the differences among countries in the international expansion strategies of their MNCs. Japanese firms, especially in their early investment in the U.S.A., preferred establishing new subsidiaries rather than acquisitions (Kogut and Singh, 1988). The higher propensity for greenfield investments reduces the overall exit rate of Japanese subsidiaries. After we controlled for the effects of entry strategy and other strategy variables, however, other home country influences such as cultural difference negatively affected the survival of Japanese subsidiaries. Future research is needed to further examine the effect of home country influences.

In order to control for both the size of the parent company and the size of the foreign subsidiary, we grouped foreign subsidiaries into three categories according to their size and then compared the exit hazard of medium and large subsidiaries to that of smaller ones. The results for the overall sample show that large foreign subsidiaries are less likely to exit than small ones. In the industry subsamples, however, this result was not consistent. For example, in the computer industry only medium-sized subsidiaries were shown to be significant, while subsidiary size had no effect in the pharmaceutical sample. The results also show that the size of the parent firm largely did not have a significant effect on the survival of foreign subsidiaries; the effects of parent firm size disappeared after we added strategy variables in the models.[13]

We also explored the time specification of exit rates of foreign subsidiaries by including a linear and quadratic term of subsidiary age in the

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[12] In the computer industry, the standard error for joint venture variable is not stable, due to the small number of joint ventures in the sample. Therefore, the joint venture variable was excluded from the computer model. This exclusion did not change the results of other variables.

[13] For the pharmaceutical industry, we examined models which include both size dummies and models with only one size dummy. No size effect was found in either case.

models. The results show that in the computer industry the exit rate decreases as the age of foreign subsidiaries increases. However, the age effect disappears after adding strategy variables in the model.[14] In the pharmaceutical industry, we observed a non-monotonic relationship between subsidiary age and exit rate of foreign subsidiaries. That is, the exit rate will increase with the age of the subsidiary up to a certain point; however, after passing this point the exit rate decreases with subsidiary age. The inflection point is about 4.3 years. This suggests that there is a 'honeymoon effect' in the pharmaceutical industry (Fichman and Levinthal, 1991), meaning that initial resources in the investment may buffer the new subsidiary from failure. This non-monotonic effect is also found in the overall model, with an inflection point of 4.7 years.[15]

DISCUSSION

Diversification strategy

Although a large number of previous studies have examined the relationship between diversification and performance in the strategy literature, the findings have been inconclusive. One of the reasons for this is the short-term, cross-sectional nature of both the accounting-based measures and the market-based measures of firm performance used in those studies. Because a long-term measure of subsidiary performance (survival) is used in this study, the findings clearly reveal the relationship between product diversification and performance. Foreign subsidiaries that diversify into different product areas from their parents are less likely to survive in the long term. The findings also suggest that, from the perspective of a corporate division or subsidiary, those divisions that are not in the core business areas of the parent firm are more likely to be divested by the parent. The result is consistent with observations of recent restructuring activities in many companies.

A second important feature of this study is its

measurement of performance at the subsidiary (or strategic business unit) level, rather than at the corporate level. Accounting or market-based measures are usually gathered at the corporate level since such performance data are usually not available at the subsidiary level. Changes in the performance of the parent company, however, may be only indirectly related to the performance of the affected subsidiary or division, which is more directly related to the consequences of product diversification. While this paper uses the survival of the foreign subsidiary as a proxy for performance over time, future research with a fine-grained measure of subsidiary performance is clearly needed.

The results are consistent with theories of foreign direct investment and international strategy. Theories of foreign direct investment have long emphasized the role of ownership or competitive advantage in foreign direct investment (Dunning, 1988). The strategy literature has also discussed the disadvantages of unrelated product diversification (Franko, 1989). Foreign investments that are not in the same product market as the parent are less likely to survive. Entering into a foreign market is itself a high-risk venture; adding to that risk by diversifying into an unfamiliar product area increases the exit hazards of foreign subsidiaries. This conclusion should recommend caution for managers of MNCs. When expanding overseas, the company should stay within the core business area where the parent is more likely to have competitive advantages or complementary assets.

Entry strategy

The higher exit hazards associated with foreign acquisitions suggest that the difficulty of integrating the acquired subsidiary into the parent system should not be underestimated. This difficulty can offset any benefits of reducing uncertainty in a foreign market through foreign acquisitions. Subsidiaries established as greenfield investments are also more likely to use technologies developed at the parent firm and personnel linked to the parent organizations. There is also likely to be a stronger managerial attachment between managers of the subsidiary and the parents in greenfield investments. This interpretation is consistent with findings of previous studies (Wilson, 1980).

[14] For the computer industry, we examined models with both linear and quadratic terms of subsidiary age. No quadratic effect was found. Therefore we report the results of models with a linear age variable.
[15] However, the age effect may also suggest that the heterogeneity in the exit rate is not entirely explained by variables included in the study.

The task of integrating acquired foreign firms is particularly challenging for MNCs. Indeed, even domestic acquisitions have been shown to suffer from substantial post-acquisition costs and concerns over the organizational fit of the two firms (Jemison and Sitkin, 1986). The integration of foreign acquisitions will also have to contend with differences in national culture, as well as disparate organizational structures, organizing principles, and institutional environments (Kogut, 1991a; Westney, 1993). These differences often lead to misunderstandings and conflicts between managers of the parent firm and foreign subsidiaries, and increasing the exit hazard of the subsidiaries.

Conflicts between joint venture partners may also lead to venture instability and termination. Unlike greenfield investments, commitment to the joint venture from a particular parent is dependent upon the position taken by the other parent. In addition, parent firms may attempt to guard against disclosing proprietary knowledge such as new technology to the partners. Empirical studies have suggested that joint ventures often serve as an intermediate strategy for a parent firm, with an option to buy out the other partner when the future is promising, or to divest if the outlook seems bleak (Kogut, 1991b). This non-committal nature of some joint venture decisions is likely to lead to a high exit hazard. These results seem to confirm the findings of previous research on the instability of joint ventures and difficulties in the control–performance relationship (Killing, 1983; Kogut, 1988).

Clearly, future research is needed to develop a theory of entry choices. Our findings suggest that the methods by which foreign firms enter a market have considerable performance consequences, and clear implications for managers of multinational firms. The higher exit hazard for foreign acquisitions and joint ventures suggests that the benefits derived from these entry strategies may not offset the difficulties in integrating the acquired subsidiaries and managing the relationships between the partners.

Organizational learning and experience

The international expansion process has been characterized in the literature as a process of knowledge development and incremental commitment. It seems clear that organizational learning and experiences in foreign operations enhance the survival probabilities of foreign subsidiaries. Subsequent foreign entries benefit from the learning and experience gained from previous operations; experienced managers who are familiar with both the local market conditions and the parent structures are available to help the new subsidiary overcome the initial difficulties.

The organizational learning approach seems to be useful for understanding international operations of multinational firms. Economic theories of FDI have often assumed that firms possess perfect information on foreign markets, and that any foreign entry is a rational decision based on market conditions. Empirical analyses of foreign direct investment, however, suggest that managers of MNCs rarely have complete information regarding a foreign market when making entry decisions. Aharoni (1966), for example, argues that the decision process of FDI is often based on very incomplete information about potential host markets. Kobrin (1982) shows that MNCs often do not adequately analyze the political, social, and other factors in the host market when making foreign investment decisions. Kobrin (1988) further suggests that managers of the parent company rely primarily on managers of existing foreign subsidiaries for information on host market conditions. These studies are consistent with our findings.

CONCLUSION

This study analyzed data on the entry and survival of foreign subsidiaries in the U.S. computer and pharmaceutical industries over the 1974–89 period to determine differentials in exit hazards associated with different strategies. The most important finding of this study is that strategic choices are associated with different hazards of exit for foreign subsidiaries. This study confirms that the risks of international expansion should not be underestimated. It demonstrates that there are effective strategic decisions that can reduce the likelihood of exit associated with international expansion.

The results show that diversification strategies, entry strategies, and organizational experience have significant effects on the exit hazards of foreign firms in the U.S.A. Specifically, we found that diversifying into unrelated product

areas increases the exit hazard of foreign subsidiaries; that foreign entries through acquisitions and joint ventures are more likely to exit than greenfield investments; and finally, that firms benefit from experience in international operations and learning from other foreign investors. Although the hypotheses are largely supported for both the computer and pharmaceutical industries, there remain some differences between the two industries. Future research should examine the effects of industry and home country influences on subsidiary survival.

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APPENDIX

Appendix 1 (a): Means, standard deviations and correlation matrix: Overall model

Variables	Means	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. EXIT	0.07	0.25	1.0													
2. DIVER	0.19	0.39	.27*	1.0												
3. MA	0.63	0.48	.12*	.27*	1.0											
4. JV	0.04	0.20	.06*	-.03	-.27*	1.0										
5. EXPER	0.26	0.44	.11*	.09*	.00	.02	1.0									
6. INVT	0.32	0.66	-.10*	-.03	-.13*	-.06*	-.18*	1.0								
7. CONC	34.2	9.94	-.02	.11*	.09*	-.18*	-.05	.01	1.0							
8. GROWTH	0.11	0.07	-.01	.07*	.08*	-.04	-.03	.01	.03	1.0						
9. AGE	4.01	2.85	-.05	.09*	-.02	-.07*	-.13*	.11*	-.09*	-.13*	1.0					
10. PHAR	0.47	0.50	.02	-.11*	-.08*	.18*	.05	-.02	-.10*	-.04	.06*	1.0				
11. JAPAN	0.22	0.41	-.08*	-.08*	-.19*	.06*	.06*	.11*	.15*	-.14*	-.11*	-.15*	1.0			
12. SIZE2	0.20	0.40	-.02	-.02	.11*	-.10*	.09*	-.21*	.04	.00	.03	-.04	.04	1.0		
13. SIZE3	0.39	0.49	-.08*	.02	.10*	-.14*	.20*	.19*	.04	.01	.04	-.04	.01	-.40*	1.0	
14. PSIZE2	0.34	0.47	.06*	.05	.07*	.16*	-.03	.01	-.14*	.05	-.03	.15*	.10*	.14*	-.13*	1.0
15. PSIZE3	0.41	0.49	-.14*	-.20*	-.04	-.14*	-.42*	.12*	.06*	.00	.17*	-.06*	.07*	-.13*	.24*	-.60*

*$p < 0.05$; $N = 1235$

Appendix 1 (b): Means, standard deviations and correlation matrix: Computer firms

Variables	Means	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. EXIT	0.06	0.24	1.0												
2. DIVER	0.23	0.42	.03*	1.0											
3. MA	0.67	0.47	.15*	.30*	1.0										
4. EXPER	0.24	0.43	.16*	-.01	-.07*	1.0									
5. INVT	0.33	0.63	-.07	.08*	.00	-.16*	1.0								
6. CONC	43.5	1.09	-.05	-.01	.05	.01	-.05	1.0							
7. GROWTH	0.11	0.09	-.02	.09*	.09*	-.05	.03	-.15*	1.0						
8. AGE	3.85	2.77	-.03	-.06	-.01	-.19*	.17*	-.07	-.02	1.0					
9. JAPAN	0.26	0.45	-.09*	-.10*	-.26*	-.07	.18*	.14*	-.18*	-.13*	1.0				
10. 1978	0.22	0.42	.06	.12*	.21*	-.21*	.03	.14*	.37*	.27*	-.20*	1.0			
11. SIZE	0.21	0.41	.02	-.05	.07	.12*	-.26*	-.08*	-.02	.00	-.05	-.05	1.0		
12. SIZE2	0.42	0.49	.06	.11*	.11*	-.23*	.33*	-.01	-.01	.03	.10*	.01	-.44*	1.0	
13. PSIZE2	0.28	0.45	.04	-.01	.08*	-.11*	-.17*	-.03	.10*	-.02	.10*	.31*	.19*	-.01	1.0
14. PSIZE3	0.44	0.50	.13*	-.15*	-.05	-.44*	.23*	-.07	-.02	.14*	.09*	-.17*	-.19*	.17*	.55*

*$p < 0.05$; $N = 650$

Appendix 1 (c): Means, standard deviations and correlation matrix: Pharmaceutical firms

Variable	Means	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. EXIT	0.07	0.26	1.0													
2. DIVER	0.15	0.35	.26*	1.0												
3. MA	0.59	0.49	.10*	.29*	1.0											
4. IV	0.79	0.27	.09*	.00	-.35*	1.0										
5. EXPER	0.29	0.45	.07	.24*	.08	.03	1.0									
6. INVT	0.31	0.69	-.11*	-.17*	-.27*	-.07	-.21*	1.0								
7. CONC	23.8	1.54	.05	.10*	.04	.03	-.08	-.04	1.0							
8. GROWTH	0.11	0.03	.00	.02	.12*	-.06	.02	-.04	.01	1.0						
9. AGE	4.19	2.93	-.07	-.11*	-.01	-.11*	-.08*	.05	-.39*	-.05	1.0					
10. JAPAN	0.15	0.36	-.08	-.09*	-.14*	.13*	.26*	.02	-.14*	-.06	-.07	1.0				
11. 1978	0.34	0.47	.03	.16*	.34*	-.10*	.09*	-.12*	.24*	.20*	.30*	-.18*	1.0			
12. SIZE2	0.18	0.38	-.02	.00	.15*	-.12*	.05	-.17*	.00	.04	.07	.17*	.17*	1.0		
13. SIZE3	0.37	0.48	-.09*	-.10*	.07	-.22*	.17*	.05	-.02	.01	.07	-.12*	-.09*	-.35*	1.0	
14. PSIZE2	0.42	0.49	.07*	.16*	.09*	.22*	.02	.18*	.05	-.03	-.06	.31*	.01	.12*	-.25*	1.0
15. PSIZE3	0.38	0.49	-.15*	-.30*	-.03	-.23*	-.39*	.00	.01	.04	.22*	-.32*	.18*	-.06	.33*	-.60*

*$p < 0.05$; $N = 585$