

## THE EFFECT OF OWN-FIRM AND OTHER-FIRM EXPERIENCE ON FOREIGN DIRECT INVESTMENT SURVIVAL IN THE UNITED STATES, 1987–92

J. MYLES SHAVER<sup>1\*</sup>, WILL MITCHELL<sup>2</sup> and BERNARD YEUNG<sup>2</sup>

<sup>1</sup>Leonard N. Stern School of Business, New York University, New York, U.S.A.

<sup>2</sup>University of Michigan Business School, Ann Arbor, Michigan, U.S.A.

*We argue that foreign firms operating in a host country generate information spillovers that have potential value for later foreign direct investment. We test two predictions. First, we expect foreign direct investments by firms with experience in a host country to be more likely to survive than investments made by first-time entrants. Second, foreign direct investments will be more likely to survive the greater the foreign presence in the target industry at the time of investment, subject to two contingencies. The first contingency is that the relationship will be weak or nonexistent among firms with no experience in the host country, because these firms have difficulty evaluating and taking advantage of the information spillovers. The second contingency is that the presence of other foreign firms will not affect investment survival among firms that already have a presence in the target industry and undertake expansion. These firms already possess general information about the target industries and are unlikely to gain additional benefit from information spillovers. We find supportive evidence based on the survival to 1992 among 354 U.S. investments undertaken by foreign firms in manufacturing industries during 1987. © 1997 by John Wiley & Sons, Ltd.*

Strat. Management J. Vol. 18: 811–824, 1997

No of Figures: 1. No of Tables: 3. No of References: 35.

### INTRODUCTION

Although several studies suggest that foreign firms learn from their previous experiences in a host country (Johanson and Vahlne, 1977; Newbould, Buckley, and Thurwell, 1978; Li, 1995), less attention has been directed to the possibility that foreign investors learn from the experiences of previous foreign entrants (Mitchell, Shaver, and Yeung, 1994). Because previous entrants often undertake actions that can be interpreted and imitated by later entrants, information spill-

overs from previous entrants' experiences can be an important information source for many firms that undertake foreign direct investment. This paper investigates how firms' own experience in a host country and the experience of other foreign entrants in the target industry affect the survival of foreign direct investments.

Our empirical analysis provides an indirect test of the impact of information spillovers on investment survival. We argue that foreign investment creates information spillovers concerning industry operating conditions. We also argue that firms often need experience in the local market in order to evaluate and take advantage of the information spillovers. To test the arguments, we use survival of a foreign-owned investment as an indicator of success. Our idea implies that foreign direct investments will be more likely to survive the greater the foreign presence in the target industry

Key words: foreign direct investment; business survival; experience-own-firm; experience-other-firm

\* Correspondence to: J. Myles Shaver, Leonard N. Stern School of Business, Management Education Center, New York University, 44 West Fourth Street, New York, NY 10012-1126, U.S.A.

at the time of investment, subject to two contingencies. First, the relationship will be weak or nonexistent among firms with no experience in the host country, because a firm must be above a country-knowledge threshold in order to be able to evaluate and take advantage of information spillovers. Second, a firm must be below an industry-knowledge threshold within the host country in order to gain additional benefit from information spillovers. When a firm has operations in the host country target industry, it already possesses information about operating conditions that it will face and is unlikely to gain additional benefit from information spillovers. Thus, the positive relationship between investment success and the presence of other foreign firms will exist among firms that already have a presence in the host country but have no prior presence in the target industry of the host country. Such firms can both evaluate and benefit from the information generated from previous entrants' experiences. We find supportive evidence based on the survival to 1992 among 354 U.S. investments in manufacturing industries undertaken by foreign firms during 1987.

We test the information arguments indirectly because the acquisition and use of information are difficult to observe and measure for empirical analysis. Large-scale studies compound the difficulties because the optimality of decisions such as plant location, supplier and distributor choices, and labor practices is firm specific. Also, the creation of synergy between local and firm-specific advantages varies across firms and industries. To judge the reliability of the test, we show that the results are most consistent with our argument when compared to several alternatives.

The analysis has implications for firms contemplating foreign direct investment. Our results offer useful insights concerning how own-firm and other-firm experience influence the survival of foreign direct investment. Our idea is also consistent with arguments that foreign direct investment ought to be a sequential approach (Kogut and Kulatilaka, 1994). We suggest that initial investments provide outposts from which to learn about an environment. As well, one can view initial investments as options for making timely expansions once firms acquire adequate information about profitable expansion opportunities in a local environment.

## INFORMATION, EXPERIENCE, AND SURVIVAL

Our basic premise is that a firm's own experience in a host country and information spillovers created by the experience of other foreign firms in the host country often improve the survival chances of foreign direct investment.

Several theoretical and empirical studies suggest that foreign firms with experience in a host country usually have more information about the local environment than first-time foreign entrants. Kogut (1983) argues that new subsidiaries often benefit from what their parents have learned during previous foreign activities. Johanson and Vahlne (1977), Newbould *et al.* (1978), and Wilson (1980) all show that experience of a parent company affects the success of a foreign subsidiary. Pennings, Barkema, and Douma (1994) also find that successful expansion breeds future success. Li (1995) shows that first-time entrants to the U.S. computer and pharmaceutical industries are more likely to fail than repeat entrants. We, therefore, expect foreign direct investments by firms with experience in a host country to be more likely to survive than investments made by first-time entrants.

Researchers have directed less attention to the possibility that investing firms also might benefit from previous foreign entrants' experiences in a target industry. Later entrants often can learn from earlier foreign entrants' activities because much of the information generated by investing foreign firms' activities becomes public knowledge that other foreign entrants can digest and use. Such nonappropriable information includes knowledge of product-market segmentation, suppliers, plant locations, productivity and characteristics of the workforce, marketing practices, distribution systems, regulatory practices, and other activities. Previous foreign entrants' experiences may provide blueprints for other foreign investors to imitate and roadmaps of pitfalls to avoid. To the extent that an entrant can learn from the mistakes and successes of earlier foreign entrants, managers are more likely to make appropriate choices for sourcing, production, marketing, organizational, and other activities (Mitchell *et al.*, 1994). Experience from interactions between earlier foreign entrants and local suppliers of raw materials, labor, and managerial skills also may reduce communication and transaction difficulties

between later foreign entrants and the local suppliers. Thus, the earlier foreign entrants to a host country often will help pave the way for later entrants to the country.<sup>1</sup>

Honda's investment in the U.S. automobile industry provides an illustrative example of how other-firm experience may improve the chances that a foreign direct investment will succeed. Part of Honda's success stems from what Honda learned from Volkswagen's unsuccessful automobile assembly operation in the United States. Before Honda made its direct investment in automobile assembly in Ohio in 1982, the company extensively studied Volkswagen's American manufacturing operations (Shook, 1988). Volkswagen became the first foreign automobile manufacturer to produce in the United States after World War II when it acquired a manufacturing facility that Chrysler built but never operated. Honda concluded that Volkswagen's problems stemmed from poor quality, troubled labor relations, and the choice of a price-sensitive product. To reduce quality problems, Honda manufactured in the United States an automobile model that established high production quality elsewhere. To reduce potential labor issues, Honda chose a plant location where the United Auto Workers union was weak and set up a non-unionized shop. The company also chose to build a mid-market vehicle with higher margins and less price sensitivity than the Volkswagen choice. In addition, Honda copied some of Volkswagen's successful strategies: choosing a rural site, negotiating an incentive package from the host state, and hiring a young motivated workforce (Hundley, 1988). Volkswagen shut down its American automobile assembly facility in 1986 after several years of declining production, whereas Honda continues to operate successfully in the United States.

There are two refinements on the argument that firms benefit from the experience of prior foreign entrants. First, we expect the benefits of other foreign firms' experience to increase with the extent of foreign presence in the target industry. The greater the foreign presence, the more

examples of successful and unsuccessful practices. For investing firms that can understand the implications of other foreign entrants' experiences, the information spillover becomes more refined. Also, the greater the foreign presence, the less will be the communication gap and transaction difficulties between new foreign entrants and locals.

We acknowledge that foreign presence in an industry might capture effects on foreign direct investment survival other than information spillover. For example, it might indicate that foreign firms have competitive advantage in the industry versus domestic firms or that there is an advantage to controlling international operations. However, these interpretations are not subject to the refinement that we introduce next. We revisit these and other alternative explanations in greater detail when discussing the empirical findings.<sup>2</sup>

Our second refinement concerns a firm's ability to take advantage of spillovers from other firms' experience. We address two contingencies: (1) a firm must be above a country-knowledge threshold in order to be able to learn from previous entrants; and (2) a firm must be below an industry-knowledge threshold within the target country in order to have something to learn.

The first contingency is that we expect investing firms with prior operations in the host country to receive more benefit from information spillovers, compared with firms having no host country presence. Prior operations in the host country provide a general understanding of the host country environment that managers require in order to interpret information spillovers. By contrast, firms without operations in the host country often are unaware of other foreign firms' actions in the host country. Even if these firms obtain information about previous foreign entrants' actions from business press or from

<sup>1</sup> Although foreign investors might also benefit from the experiences of domestic competitors in a target industry, the experience of previous foreign investors will tend to be more useful because foreign investors and domestic firms usually have different backgrounds and face different operational difficulties.

<sup>2</sup> When foreign presence in the industry is at very high levels, there is the possibility that overcrowding occurs and that foreign direct investment will be less likely to survive (Mitchell, Shaver, and Yeung, 1992, 1994). It is an empirical question whether (1) the relationship between survival and greater foreign presence becomes negative at high levels of foreign presence or (2) foreign firms cease entering the target industry at such points. In the former case, the relationship between foreign presence and investment survival will first rise and then fall. In the latter case, there will be only the predicted increasing relationship. In sensitivity analyses of our central results, we explore the possibility of the nonlinear relationship.

market analysts, their more limited understanding of the foreign business environment sometimes causes them to misinterpret or misapply the information. Therefore, many firms without experience in the host country realize little benefit from the presence of other foreign firms.<sup>3</sup>

The second contingency is that we expect firms that already have a presence in the host country target industry to gain little new knowledge from the information spillovers generated by other foreign entrants. These firms have their own experience from which to evaluate industry-specific information and need not rely on the experience of other firms. This is consistent with the results of Argote, Beckman, and Eppe's (1990) study of learning in Liberty Ship yards during World War II. They show that new shipyards learned production skills from existing shipyards up to the point when they make their own investment. After investing, the shipyards primarily benefited from their own experience.

Figure 1 summarizes our operationalized hypotheses. The vertical axis measures the survival rate while the horizontal axis measures the level of foreign presence in the target industry. The top flat line represents the survival of firms with a prior presence in the target industry of the host country. These firms have enough information about the target industry in the host country that they have little need of information from other firms. Hence, their already high survival rate is not affected by foreign presence in the target industry. In the middle is the upward sloping survival rate of firms with a presence in the host country but not the target industry of the host country. These firms can best take advantage of relevant information spillovers from other

firms' activities and the greater the foreign presence, the greater the benefit. The bottom of the hierarchy are firms with no experience and presence in the host country, which might or might not have experience in other foreign countries. The line is flat because these firms are not capable of taking advantage of spillover information about a target industry in a host country, holding other capabilities constant. For two reasons, even firms with international experience in countries other than the host country face difficulties in taking advantage of spillover information. First, the firms might be slow to act owing to their lack of presence. Second, there is growing evidence that even experience in seemingly similar countries such as nations within Europe or from Canada to the United States is not easily transitive (Lane and Hildebrand, 1990; Evans, Lane, and O'Grady, 1992; Hilton, 1992).

We find few preceding studies that address elements of the relationship between other-firm experience and the survival of foreign direct investments. Mascarenhas (1992) found survival disadvantages for early followers relative to first and later entrants (including domestic and foreign firms) in new offshore oil drilling markets, where localization pressures created advantage for domestic firms as the markets aged. Mitchell *et al.* (1994) found that Canadian entrants to U.S. medical sector industries were more likely to survive if there were moderate levels of prior foreign presence in the target industry at the time of entry. Neither study examined the impact of own-firm experience in the host country on survival.

## DATA AND VARIABLES

### Sample

We derived our sample from the Department of Commerce, International Trade Administration Publication *Foreign Direct Investment in the United States, 1987 Transactions* (subsequently referred to as the *Transactions List*). This source used 'generally available public sources, transaction participants, and miscellaneous contacts' (Department of Commerce, 1988: 1) in order to provide a list of all publicly known instances of foreign direct investment in the United States in 1987. As a result, the sample provides comprehensive coverage of foreign direct investment into

<sup>3</sup> A possible counterargument is that a firm might hire consultants in order to overcome the difficulty of collecting, interpreting, and applying information about the host country. However, consultants will not overcome all the information problems that a firm without a presence in the host country faces. Choosing consultants, interacting with consultants, and ultimately managing the consultants' recommendations is an uncertain process for the foreign firm. The knowledge transfer between the consultants and the company often will be incomplete. Consultants may provide useful guidelines, but the ultimate responsibility for decision-making and implementation falls on the investing firm's managers who have an incomplete understanding of the host nation operating environment. Although consultants and other means of acquiring information undoubtedly help some firms without a presence in the host country to interpret the actions of previous foreign entrants, we expect the benefits to be weaker than in cases where foreign firms have host country presence.

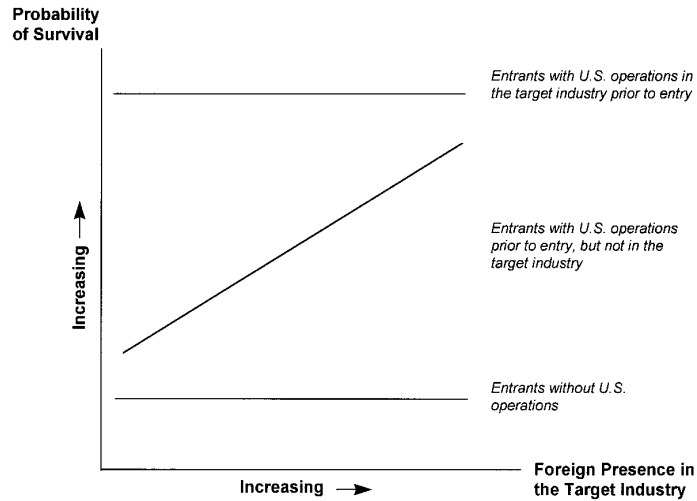


Figure 1. Operationalized hypotheses

the United States from all nations. The United States is an appropriate setting to test our arguments because there are few government restrictions with respect to foreign direct investment in the United States (Graham and Krugman, 1991). Government intervention in foreign direct investment, say, by limiting the number of foreign entrants or granting them monopoly access to markets or inputs would have a strong political influence on investment survival and thus would reduce or even eliminate the empirical relevance of our hypotheses. Excluding real-estate transactions, the publication identified 1219 foreign entries by over 800 firms.

We limited the sample by the form of investment, industrial sector, and data availability. First, we included only investments listed in the *Transactions List* as new plants or acquisitions/mergers. New plants and acquisitions represent newly established ownership control of an operation and the survival of such investments is our focus. We excluded joint ventures, plant expansions, equity increases, and other investments. We excluded joint ventures because firms may engage in a joint venture in order to absorb capabilities from their partners and then dissolve the venture. Plant expansions are often capacity additions to successful businesses, which would bias upward the survival chances of the new investment. Equity increases involve existing foreign investments in which the foreign stake has increased, and would also bias survival upward. The 'other' classification includes investments under diverse or

unknown conditions. Second, we limited the sample to foreign manufacturing entries (SIC 2000–3999) because the *1987 Census of Manufacturers*, a source for some of the variables in the study, covered only these industries. Focusing on manufacturing also helped us eliminate possible differences in conditions across industrial sectors. Third, we eliminated 51 entries during the data collection process. The entries included joint ventures by two or more foreign firms, entries that were double counted, entries on the *Transactions List* that could not be independently verified, entries where the investment was made for stated portfolio investment purposes such that the foreign firm did not seek control, and entries for which the *1987 Census of manufacturers* did not report the four-firm concentration ratio for the target industry, which is a control variable in our statistical analyses. The resulting sample includes 354 entries, including 237 acquisitions/mergers and 117 new plants, by 311 firms.

A confounding effect in data collection arose due to the reclassification of the SIC categories in 1987. The *1987 Transactions List* classified the transactions on the basis of the pre-1987 categories. By contrast, the *1987 Census of Manufacturers* and the publication *Foreign Direct Investment in the United States: Establishment Data* used the new classifications. The *Standard Industry Classification Manual: 1987* provided information regarding the conversion of pre-1987 to 1987 SICs. Fifty-five of the 209 industries in the sample experienced some change in SIC

definition, requiring 69 of the transactions to be reclassified. Of these 69 transactions, 19 required no judgment in assigning the new SIC because the entire old SIC was renumbered or became part of a new SIC. However, 50 transactions required some judgment in assigning the new SIC because the old SIC split into several 1987 SICs. In these cases, we classified the event into the 1987 SIC based on the description of the business from the archival data collection and the industry classification of the firm or establishment that appeared in *Ward's Directory* (1989) or the recent Dun and Bradstreet's *Market Identifiers*. The *Transactions List* also assigned SICs that did not exist in two cases. Here, we identified the industry based on the description of the entry from the archival search.

We segmented the data into three subsamples in order to investigate the empirical relationship between prior foreign firm experience and investment survival: (1) firms already present in the target industry in the United States; (2) firms already present in the United States but not in the target industry; and (3) firms without a presence in the United States. We used *Who Owns Whom, 1987* to identify whether or not a firm had a presence in the United States. These data record many methods of participation in the United States, including manufacturing facilities, sales offices, and distribution facilities. To determine whether a firm had an existing presence in the American industry that it entered during 1987, we turned to the *1985 Directory of Foreign Manufacturers in the United States* and the *Transactions Lists* for 1985 and 1986. The *Directory* listed the set of foreign manufacturers in the United States at the beginning of 1985. The *Transactions Lists* identified new foreign entries during the respective years. We classified firms as having operations in the same industry if the *1985 Directory of Foreign Manufacturers in the United States* or the 1985 or 1986 *Transactions List* indicated that they had an investment in the same 2-digit SIC as their 1987 entry.

### Dependent variable

We defined investment survival as a dummy variable that indicates whether the foreign firm still controlled the investment in 1992. An advantage of this measure is its consistency with the data on foreign entry. We measured survival with

respect to the new plant or the acquired operations. We collected the survival data from an extensive archival search. Sources included electronic data bases, Dun and Bradstreet's *Dun's Market Identifiers*, *The Directory of Foreign Firms Operating in the United States: 7th edition* (1992), *The Directory of International Affiliates* (Fall 1992), *Who Owns Whom* (1993), and *The Directory of Foreign Manufacturers in the United States: 5th edition* (1993). Common financial outcome measures such as accounting or financial returns were unavailable at the level of analysis used in this study because the sample primarily consists of individual investments by divisions of large foreign firms that do not report disaggregated financial performance. Of the 354 foreign direct investments in the sample, the foreign parent continued to hold 76 percent (229 investments) in 1992. This indicates that nearly one in four foreign investments in 1987 survived less than 5 years.

It is useful to describe how survival captures the underlying economic performance of foreign direct investment. A firm might cease to control its American investment by liquidating or declaring bankruptcy on its investment. In such cases, the firm's operations were not sustainable and loss of control stems from economic failure. In addition, a firm might sell its investment to another firm. This condition can occur if the foreign firm encounters difficulty operating its investment and expects failure or low returns in the future, so that poor economic performance causes the divestiture of the investment. Alternatively, a purchasing firm might derive greater value from operating the assets of a successful investment (Duhaime and Grant, 1984). Despite the latter condition, we classified all divestitures as unsuccessful for three reasons. First, we reviewed the conditions of the sale as reported in the business press when a firm sold its investment. There were no instances in which observers reported that the owner divested successful operations. Instead, the reports often stated that the foreign firm's investment was performing poorly. Second, we focused on divestitures within a relatively short period: 5 years. Kaplan and Weisbach (1992) note that divestitures that resulted from business failure or showed losses on sale were more likely to occur within 7 years. Third, given the expenditure of financial and managerial resources incurred in most international expan-

sions, changes in strategy that result in the divestment of foreign assets soon after expansion usually stem from poor performance of the investment (Bane and Neubauer, 1981).

### Measures of foreign presence

We employed two measures of foreign presence in the target industry: (1) percentage of establishments within an industry controlled by foreign firms; and (2) percentage of industry shipments from foreign-owned establishments. The source of these data is the Department of Commerce, Bureau of Economic Analysis publication *Foreign Direct Investment in the United States: Establishment Data*. These data are derived from a link between the Bureau of Economic Analysis, which requires foreign firms to disclose their operations in the United States, and the Census Bureau, which collects establishment-level data with respect to business activity in the United States. These data provide a comprehensive picture of foreign investment within the United States at the establishment level.

We collected the percentage of establishments within an industry controlled by foreign firms in 1987 at the 4-digit SIC level. The numerator of this variable measures the number of foreign establishments in an industry. As the number of foreign-controlled establishments in an industry increases, so does the pool of other foreign firms' experiences from which investors can benefit. We scaled the count of foreign establishments in the industry by the total number of establishments in the industry to permit comparability across industries. Because some industry definitions are broader than others, unscaled counts of foreign establishments would not provide meaningful measures of foreign presence. A larger percentage of foreign-owned establishments in an industry indicates a larger pool of foreign experiences from which new investors can benefit. This measure might understate previous foreign entrants' experiences if investors are able to benefit from the experiences of foreign firms that previously participated in but have exited the industry.

Our second measure, the percentage of industry shipments from foreign establishments, was also collected for 1987 at the 4-digit SIC level. This measure estimates the extent to which foreign businesses have established a strong presence in the target industry. High levels of foreign share

indicate that foreign firms have put successful operating methods into practice, which provide potential models from which later foreign entrants might be able to learn. The percentage of industry shipments from foreign-controlled establishments is a superior measure to the percentage of foreign establishments if we assume that successful foreign entrants provide particularly useful information to later entrants. However, this variable was available for only a subset of the industries because the Bureau of Economic Analysis does not disclose such data when there was only one foreign firm in an industry.

### Control variables

In order to reduce problems created by missing variables, we defined five control variables to address other factors that might influence investment survival. The variables include the availability of parent firm data, the entry mode, the number of U.S. subsidiaries of the corporate parent, industry concentration, and international presence of American firms in the industry.

We coded a dummy variable as one if financial data are available for the foreign parent, zero otherwise. Our aim, stemming from theories of foreign direct investment (e.g., Hymer, 1960; Caves, 1971; Buckley and Casson, 1976; Dunning, 1980), is to measure strengths of the investing parent firms. Parent firms possessing substantial stocks of intangible assets are more likely to succeed in foreign direct investment (Morck and Yeung, 1992). We were not able to obtain common measures of intangible assets such as R&D and advertising intensity for a substantial portion of our sample firms. An alternative is to use the dummy variable that identifies the availability of financial information. We expect investments by these firms to have survival advantages because they tend to be large and publicly traded. In turn, such firms often have greater stocks of intangible assets, tangible assets, and international experience. Aldrich and Auster (1986) and Mitchell (1994) review the literature showing that larger firms and businesses are less likely to shut down. Mascarenhas (1989) finds that publicly held offshore drilling firms have greater growth, international scope, product line scope, and size compared to privately held firms. Mitchell and Singh (1996) report negative correlation between private business status and sales. These theoretical

and empirical results support the use of the financial availability dummy as a measure of firm strength. We gathered parent financial data from two data bases: *Compustat Global Vantage* and *Worldscope*. *Compustat Global Vantage* contains data on 7200 firms in 30 countries and *Worldscope* provides data on 10,000 firms in 40 countries. We were able to obtain financial data for less than 60 percent of the cases in our sample. We emphasize that we employ the financial availability dummy as an indicator of firm strength owing to the data constraints. Many other studies have limited their analysis to firms for which financial data is available. Because this study focuses on the impact of experience in a foreign market, it is essential that we include as wide a range of firms as possible.

We also control for potential survival differences among entry via acquisition/merger and new plants. We coded a variable as one if the entry occurred via acquisition and zero if entry occurred via new plant. Wilson (1980), Delacroix (1993), and Li (1995) show that investments undertaken through acquisition have higher failure rates than new plants. The failure could stem from the difficulty of merging organizations (Caves, 1982; Jemison and Sitkin, 1986) or from managerial loyalty to new ventures (Wilson, 1980).

We measured the number of American affiliates that the foreign firms controlled in 1987, as recorded in *Who Owns Whom, 1987*. The variable is zero if the foreign parent has no presence in the United States in 1987. We included this variable because firms with greater presence in the United States might have survival advantages if greater presence translates into greater knowledge about operating in this country.

In order to control for the effect of entry barriers on survival, we gathered the four-firm concentration ratio at the 4-digit SIC level. The source of these data is the *1987 Census of Manufacturers*. Higher entry barriers are likely to lower the chances of survival. Kessides (1990) shows that the four-firm concentration ratio is a good proxy for the existence of sunk costs, which indicate the existence of barriers to entry.

Finally, we calculated the proportion of American firms in each industry that had international operations. Industries in which many U.S. firms have international presence might indicate that the industry structure suits international operation. Foreign firms that expand into the United States

under such industry conditions will likely have survival advantages, although the underlying difficulties of entering the United States will still exist. A complementary interpretation is that industries in which many American firms have international operations might be industries where foreign firms believe that long-term competitiveness hinges upon operating in the United States. Under this scenario, foreign firms might be more willing to maintain their American operations even if they are not immediately profitable. For each American firm in the *Compustat PCplus* data base we identified all 4-digit manufacturing SICs in which the firm operates. We classified the firms as having international operations if they reported foreign income or foreign taxes in 1987. If a firm had foreign operations, we coded all of the company's 4-digit operations as international. We then calculated the proportion of firms with international operations within each 4-digit SIC. Table 1 reports summary statistics for the variables.

## RESULTS

### Own-firm experience

We tested our first prediction by comparing the outcome of the dependent variable across the three subsamples, as reported in Table 2. The table reports a cross-tabulation of the relationship between investment survival and parent firm experience in the host country, comparing the survival rates within the three subsamples. The three groups of entries have different survival rates as exhibited by the  $\chi^2$  test results. As expected, the lowest survival rate is for the group of firms without a presence in the United States at the time of investment (69%). The survival rate for firms that had an existing presence in the United States in industries other than the target is 75 percent. Firms that invested in an industry in which they already had an existing presence exhibit the highest survival rate (87%). The difference in survival rates is consistent with the argument that firms with prior experience in the host country have information advantages that help make their entry attempts more likely to succeed than entries by firms with no prior host country presence.

The survival comparison in Table 2 might also reflect intrinsic differences in firm strength among

Table 1. Descriptive statistics and product moment correlations (354 cases, unless noted)

	1.	2.	3.	4.	5.	6.	7.	8.
1. Survival	1							
2. Percentage of establishments in the target industry controlled by foreign firms	0.10	1						
3. Percentage of shipments in the target industry from foreign establishments <sup>a</sup>	0.05	0.72	1					
4. Parent financial data available	0.17	0.04	0.13	1				
5. Acquisition entry	-0.18	0.03	0.06	-0.01	1			
6. Number of subsidiaries in the U.S.A. in 1986	0.16	0.09	0.03	0.16	0.20	1		
7. Proportion of American firms in target industry with international operations	0.17	0.13	-0.10	0.02	-0.09	0.03	1	
8. Four-firm concentration ratio	0.05	0.13	0.16	-0.10	-0.25	0.02	0.11	1
Mean	0.76	5.04	12.45	0.59	0.67	5.56	0.46	37.71
Standard error	0.43	5.34	10.67	0.49	0.47	10.36	0.16	18.72
Minimum	0	0.1	0.3	0	0	0	0	2
Maximum	1	40.4	66.8	1	1	68	0.83	90

<sup>a</sup>274 cases, missing cases due to Bureau of Economic Analysis disclosure provisions.

Table 2. Survival rate to 1992 of 354 foreign direct investments undertaken in the United States during 1987, compared to parent firm presence in United States

Parent firm presence/outcome	No U.S. presence in 1986	U.S. presence in different industry in 1986	U.S. presence in target industry in 1986
Survived	104 (69%)	72 (75%)	93 (87%)
Did not survive	47 (31%)	24 (25%)	14 (13%)
Total	151	96	107

$\chi^2$  (2 d.f.) = 11.24,  $p$  = 0.004

firms with no U.S. presence and firms with U.S. presence. The reasoning underlying this alternative interpretation is as follows. Initial entrants to a host country are likely to include both strong and weak firms. Stronger firms are more likely than weaker firms to overcome the difficulties of market entry and survive to expand in the host country. Therefore, the average survival rate among firms with no U.S. presence might reflect a more even weighting of strong and weak firms, while the average survival rate among firms with U.S. presence that are undertaking further expansion might reflect a higher weight of strong firms. The concern that firm strength and experience are intertwined, however, does not apply when

assessing the impact of prior entry by other foreign firms on investment survival, which we report below.

### Other-firm experience

We used binomial logistic regressions to examine the relationship between foreign direct investment survival and the presence of other foreign firms in a target industry. For reliability and clarity, we estimated the logistic regressions based on segregated subsamples rather than for a pooled sample. Logistic regression estimates are sensitive to heteroskedastic errors and similar problems introduced by pooling. In addition, pooling the

three groups of firms would require the use of dummies and cross-terms between dummies and other independent variables to test the hypothesis. This would create collinearity problems in the logistic regression estimates.

Table 3 reports the regression results. Columns 1 and 2 present results for investments by firms with previous U.S. presence in industries other than the target industry. Columns 3 and 4 report the results for investments made by firms with no previous presence in the United States. Columns 5 and 6 present results for investments by firms with existing operations in the target industry in the United States. Columns 1, 3, and 5 incorporate the percentage of foreign establishments as the measure of foreign presence in the target industry, while columns 2, 4, and 6 use the percentage of foreign shipments as the measure of foreign presence in the target industry.

Consistent with our hypotheses concerning the impact of other-firm experience, both measures of foreign presence are statistically significant in columns 1 and 2 of Table 3. These columns report results from the subset of firms that have at least one American affiliate at the time of entry but in a different 2-digit SIC than their 1987 investment. The results are consistent with the argument that foreign direct investments undertaken by firms with host country experience but no target industry experience will benefit from the experiences of earlier foreign entrants. In order to assess the sensitivity of the results, we explored whether the positive significant effects occurred because a few firms successfully entered industries when foreign industry presence was large. We obtained results equivalent to those in Table 3 when we excluded observations for which the values of foreign industry presence were in the top fifth percentile.

As we also expected, the coefficient estimates

Table 3. Logistic regression estimates of influences on 1987 foreign direct investment survival until 1992, by parent firm presence in the United States (positive coefficients indicate greater survival likelihood; standard errors in parentheses)

	U.S. presence in different industry in 1986		No. U.S. presence in 1986		U.S. presence in target industry in 1986	
	1.	2.	3.	4.	5.	6.
Intercept	-0.6702 (1.1919)	-0.6176 (1.6562)	1.9195** (0.8685)	2.6606** (1.1949)	-1.8663* (1.3698)	-2.3559* (1.6176)
Foreign presence in the target industry:						
Percentage of establishments	0.1414** (0.0830)		0.0229 (0.0466)		0.0458 (0.1007)	
Percentage of shipments		0.0784** (0.0392)		-0.0024 (0.0257)		0.0172 (0.0265)
Parent financial data available (0-1)	0.9952** (0.5269)	1.0940** (0.6116)	0.5197 (0.4579)	0.3590 (0.5221)	1.5092** (0.7660)	1.5348* (0.9738)
Number of subsidiaries in the U.S.A. in 1986	0.0281 (0.0323)	0.0254 (0.0359)			0.1242** (0.0539)	0.0900* (0.0565)
Four-firm concentration ratio	-0.0202* (0.0149)	-0.0266* (0.0174)	-0.0118 (0.0115)	-0.0187* (0.0141)	0.0176 (0.0187)	0.0227 (1.2029)
Acquisition entry	-0.6585 (0.6098)	-1.0826* (0.8130)	-1.7660*** (0.4931)	-2.1440*** (0.6475)	-2.9328*** (1.2016)	-1.9346* (1.2029)
Proportion of American firms in target industry with intl operations	3.6976** (1.8540)	4.2563** (2.4133)	0.7546 (1.2431)	0.6520 (1.5535)	8.9009*** (2.8012)	8.3127*** (2.9470)
Entrants (survived)	96 (75%)	75 (75%)	151 (69%)	114 (69%)	107 (87%)	85 (88%)
Likelihood ratio $\chi^2$ (d.f.)	13.4 (6)**	12.4 (6)*	18.7 (5)***	18.5 (5)***	27.0 (6)***	17.4 (6)***

\* $p < 0.10$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$  (one-tail tests)

of foreign industry presence for the other subsamples in Table 3 are nonsignificant. The results are consistent with the argument that firms with no U.S. presence at the time of entry (columns 3 and 4) are unable to learn from previous foreign entrants. The results also are consistent with the argument that firms with an existing presence in the target industry within the United States (columns 5 and 6) have already acquired general information about the industry and will realize little benefit from spillovers.

Most control variables take the expected results. The financial data availability dummy is consistently positive, although nonsignificant in columns 3 and 4 of Table 3. To the extent that the variable identifies differences in firm size, stocks of intangible assets, or previous international experience, it appears that such differences have moderate influence on foreign investment survival. As expected, firms with a large number of subsidiaries in the United States tend to be at least moderately more likely to survive. The four-firm concentration ratio is negative and at least near significant in columns 1–4, as expected, but is nonsignificantly positive in columns 5 and 6. The results in columns 5 and 6 are reasonable because firms that already have operations in the target industry would have overcome most entry barriers. As expected, investments undertaken by acquiring other firms are less likely to survive than new plants. Finally, the proportion of American firms with international operations in the target industry positively influence survival, as expected, although the result is nonsignificant in columns 3 and 4.

We conducted several sensitivity analyses, finding no material changes from the reported results. Adding firm nationality and 2-digit industry dummy variables did not affect the estimates of foreign industry presence and the two additional sets of variables were never jointly significant. Industry growth from 1987 to 1991, which we obtained from the *Annual Survey of Manufacturers*, was not significant and the estimates of foreign industry presence did not change materially when we included the growth variable. We tested for nonmonotonic relationships between survival and foreign presence, such that overcrowding might occur when foreign presence is large, by adding squared values of the foreign industry presence measures to the reported specifications. The squared terms were not significant.

### Alternative explanations for other-firm experience results

Although the reported results appear robust, we were concerned that the statistical relationship between foreign presence and survival might reflect other underlying effects. Therefore, we explored six alternative interpretations of a positive relationship between foreign presence and investment survival. This is equivalent to conducting an endogeneity check to uncover the influence of factors that affect survival and entry selection simultaneously.<sup>4</sup> None of the alternatives explain the observed relationship between foreign presence and survival as well as the argument that firms with host country experience and no target industry operations benefit from the industry-specific experiences of previous foreign entrants.

First, foreign presence might measure advantages that foreign firms enjoy relative to domestic firms in some industries. For example, foreign firms in certain industries might have superior technologies, management techniques, or brand names compared to U.S. firms. Note, however, that if large levels of foreign presence in an industry indicate that foreign firms are relatively stronger than their U.S. counterparts, we would expect all foreign entrants in the industry to be more likely to survive. In other words, foreign presence would have a positive significant effect on survival for all foreign firms. We, however, observed only a significant effect among firms with host country experience and no target industry operations.

Second, foreign presence might measure the extent to which there are benefits to controlling international operations within an industry. If the likelihood of foreign investment survival is greater in industries where there are benefits to controlling international operations, then we might be capturing this effect. However, this does not appear to be the effect that our foreign presence measures capture for the following three reasons. First, we should observe this effect across all three subgroups, not just among firms with host country experience and no target industry operations. Second, we include a variable in the empirical specification to explicitly

<sup>4</sup> Formal statistical approaches to correct for endogeneity are available (see, for example, Heckman, 1979, and, for an application see Shaver, forthcoming). There are, however, non-trivial data constraints in employing this approach.

control for the possibility that industries differ with respect to the underlying benefits associated with controlling international operations, that is, the proportion of U.S. firms with international operations. Third we examined the relationship between our measures of foreign presence and Kobrin's (1991) measure of transnational integration, employing the foreign presence measures at the 3-digit SIC level in order to align them with Kobrin's measures. The foreign presence measures were not correlated to the measure of transnational integration ( $r = 0.09$  and  $r = 0.11$ ).

Third, foreign firms might disproportionately enter industries where survival rates are greater than average. If so, large levels of foreign presence would indicate that conditions within an industry are more desirable than other industries. When comparing the consistency of this argument to the results, the conclusion suffers the same contradiction as the previous arguments. If the argument is true, then we should observe a positive relationship between foreign presence and survival of all investments, not only for firms with host country experience and no target industry operations.

Fourth, the measures of foreign presence might reflect the extent of a firm's own operations in the target industry. In this case, a positive relationship between foreign presence and survival would stem from survival advantages for firms with extensive operations in the industry in which they expand. If this argument was true, the positive effect should exist only for the subset of firms that enter industries in which they already have existing operations, which again is not consistent with the observed results.

Fifth, foreign firms might face entry difficulties related to the fixed costs of cultivating the market. Previous foreign entrants may undertake part of the market cultivation that will benefit all subsequent foreign entrants to an industry. Under this scenario, we would expect a positive relationship between aggregate foreign presence and survival of firms without operations in the target industry. Contrary to this argument, however, our results show no relationship between aggregate foreign presence and survival for firms without U.S. presence.

Finally, we examined if the positive significant relationship between foreign presence and survival might be the result of stronger firms systematically entering at higher levels of foreign industry presence. In order to investigate if stronger

firms enter later, we turned to *Compustat Global Vantage* and *Worldscope* to gather data on firm size (revenue in millions of U.S. dollars) and research and development intensity (R&D investment/total revenues) for 1986. We then used these data to assess the characteristics of firms that enter at different levels of foreign presence by regressing the measures of firm strength on the measures of foreign presence. Because we were only able to gather these data for a subset of all entries, we first determined if there was a difference in the foreign presence at entry between the following sets of firms: (1) those for which we were able to gather revenue data compared to those for which we were not; and (2) those for which we were able to gather R&D data and those for which we were not. We found no difference in foreign presence at entry in either of these comparisons. Among the subset of entries for which we have revenue data, we found no evidence that larger firms were more likely to enter industries in which the level of foreign presence was large. We also found no evidence that R&D-intensive firms entered industries in which the level of foreign presence was large. All told, there is no evidence that the positive relationship between foreign presence and survival is the result of stronger firms entering at high levels of foreign presence.

We also investigated the parallel argument with respect to the nonsignificant relationship between foreign presence and survival in columns 3–6 of Table 3. It could be argued that these entrants do benefit from information spillovers, but that weaker firms tend to enter when there are high levels of foreign presence. If so, then the entry of intrinsically weak firms would offset the spillover benefit to survival. In tests of the form identified above, however, we found no evidence that smaller or less R&D-intensive firms entered when foreign presence was larger. This sensitivity analysis suggests that the nonsignificant results do not stem from weaker firms systematically entering when foreign presence is large. Overall, our results are robust with respect to our central argument.

## CONCLUSION

The key contribution of our study is that previous foreign entrants' experience can positively affect

foreign direct investment survival but only selected firms benefit from the experience of previous foreign entrants. The empirical findings support this argument. Foreign direct investment by firms with existing operations in the United States in industries other than the target are significantly more likely to survive when the target industry has a higher level of foreign presence. We argue that these investing firms have the ability to interpret previous foreign entrants' experiences and that the experiences offer potential benefits. We observe no significant relationship between foreign presence and investment survival for two classes of firms: (1) those without existing operations in the United States; and (2) those with existing operations in the industry in which they invested. Firms with no U.S. operations lack the ability to learn from previous foreign entrants' experiences, while firms already operating in the target industry have little potential to gain additional information from other firms' experiences.

Our arguments and results highlight two sources of knowledge that are important when determining the success of foreign direct investment: (1) country-specific knowledge; and (2) industry-specific knowledge within the target country. Country-specific knowledge includes know-how of business and operating conditions in the foreign nation. Due to differences in the business environment across countries and the difficulties in knowledge acquisition from afar, such knowledge is not easily obtained unless a firm commences operations in the target country. Country-specific knowledge, then, provides context for interpreting industry-specific information in the target country. Therefore, country-specific knowledge is necessary to facilitate learning about industries within the target nation, allowing firms to identify opportunities and take advantage of the opportunities.

In practical terms, our results suggest that successful foreign direct investment is a sequential process. A firm expanding into a new location should first obtain a foothold and then use the foothold to learn about the new location so that it will have the flexibility to undertake additional investment. The managerial agenda to benefit from sequential entry and to facilitate learning about the target country industry is, first, to gather knowledge about the target country's business environment. Managers should then apply this

knowledge in a way that allows future investments in the target country to better gather and utilize information about industry conditions.

Further research could fruitfully extend this study. Of particular interest would be direct tests of whether firms benefit from previous foreign entrants' experiences and identification of firm strategies that facilitate the transfer of experience. It also would be useful to investigate whether experience in similar countries affects survival in a new host location. In addition, it would be helpful to determine whether high rates of foreign investment failure in a host country produce information spillovers that cause some firms to avoid investing in the country. In other words, does a high failure rate precede a low entry rate? Own-firm experience in the host country may play a role in this situation because firms with local experience are arguably better able to judge whether all investments are unlikely to succeed or whether the failures stem from mistakes made by particular firms. Research in these areas is likely to yield important insights concerning the success of foreign direct investment.

## ACKNOWLEDGEMENTS

The Social Sciences and Humanities Research Council of Canada supported this research through a Doctoral Fellowship to the first author. We appreciate the comments of Scott Masten, Miguel Guilarte, and the anonymous referees.

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