

## ACQUISITION VS. INTERNAL DEVELOPMENT AS MODES OF MARKET ENTRY

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*An established firm can enter a new product market through acquisition or internal development. Predictions that the choice of market entry mode depends on 'relatedness' between the new product and the firm's existing products have repeatedly failed to gain empirical support. We resolve ambiguity in prior work by developing dynamic measures of relatedness, and by making a distinction between entries inside vs. outside a firm's primary business domain. Using a fine-grained dataset on the telecommunications sector, we find that inside a firm's primary business domain, acquisitions are used to fill persistent gaps near the firm's existing products, whereas outside that domain, acquisitions are used to extend the enterprise in new directions. Copyright*

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### INTRODUCTION

The choice of entry mode is an important part of a firm's new business development strategy. A diversifying entrant is concerned not only about what markets to enter, but also about how to enter them. Although firms typically enter new markets organically through internal development, a common alternative is to acquire a firm or business unit that is already established.<sup>1</sup> In any given context, the two modes are likely to differ with respect to the cost, risk, and speed of entry. Ultimately, the success of entry may depend upon the choice of mode.

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<sup>1</sup> A further alternative is to enter via interorganizational arrangements such as joint ventures. Although common for entries into foreign markets, these modes are seldom used for domestic market entries.

Researchers have carried out numerous studies that address firms' choice of entry mode. Drawing from the resource-based view of the firm (RBV), most have proposed that the choice should depend largely on the relation between the resource base of a firm and the resource requirements of the market that is new to the firm. In particular, they have predicted that the firm is likely to use internal development to enter markets whose requirements lie close to the firm's existing set of resources and capabilities, whereas the firm may turn to acquisitions to enter markets that are far from its current resource base. This idea, while reasonable in theory, has repeatedly failed to receive empirical support. Indeed, despite many studies in strategic management and a large related literature on business acquisitions in finance, our understanding of entry mode choice remains limited.

We propose that the failure to find expected patterns stems from two limitations in prior work. First, researchers have not distinguished between entries inside vs. outside the firm's primary business domain. Second, they have not considered

the dynamics of firm expansion. In this paper we address both of these elements. We argue that within its primary business domain the firm is likely to track potential acquisition opportunities and may act opportunistically when a candidate becomes available to widen the firm's product line or fill resource gaps. By comparison, outside the primary business domain, the firm may expand along a path that stretches the enterprise in new directions, and the firm will seek acquisitions to extend this path. Thus, the choice between acquisition and internal development is likely to follow a different logic inside vs. outside the firm's primary business domain. Such ideas go beyond the existing static conceptualization of relatedness, and we develop measures to reflect the fact that the relatedness between a firm's prior market experience and a market new to the firm evolves over time. Our empirical work captures these elements, using a dataset on 1,719 entry events by 163 public companies over 15 years in the telecommunications sector.

The remaining sections of this paper are organized as follows. First, we survey studies that have addressed the choice of entry mode by diversifying firms, and how that choice may be influenced by relatedness between the firm and the new market. We then broaden the discussion to consider the relative advantages of internal development vs. acquisition as entry modes, and potential differences in their use inside vs. outside the firm's primary business domain. The empirical portion of the paper begins with our measures of firm-market relatedness, followed by details of the data sample and our methodology. Finally we present the results of our analysis and draw conclusions from our findings.

## LITERATURE REVIEW AND CONCEPTUAL DEVELOPMENT

### Prior studies on relatedness and choice of entry mode

Many researchers have argued that the degree of relatedness between a firm's new product and its existing products should influence the choice of market entry mode. In one of the earliest studies, Yip (1982) posited that relatedness reduces the costs of entry when a firm enters via internal development, because the firm can leverage its resource base to overcome barriers to entry. In

contrast, relatedness does not reduce the costs of entry when a firm enters via acquisition, since the price of the target is set by the market for corporate control. Hence, a firm is likely to enter related markets via internal development but may enter unrelated markets via acquisition.

We refer to this prediction as the 'baseline hypothesis': entry via acquisition is more likely when the new product market is less 'related' to the firm's existing products. The baseline hypothesis provides the most direct inference regarding choice of entry mode that can be drawn from the RBV. However, as we show in this paper, the hypothesis fails to hold in prior studies because it is too simple in its view of resources and the dynamics of firm expansion.

*Hypothesis 1a (baseline hypothesis): The less related a new product market is to the firm's existing products, the more likely the use of acquisition as entry mode.*

Extending Yip's (1982) model, Chatterjee (1990) argued that relatedness leads to more reduction in operating costs because the firm's resources are more applicable. Since the prospect of reducing operating costs provides an incentive for a firm to use its own underutilized resources as opposed to acquiring resources from external sources, a firm is expected to enter related markets via internal development. However, in their empirical analysis, neither Yip (1982: 340) nor Chatterjee (1990: 794, 796) found any significant relationship between measures of entry mode and relatedness.

More recent studies that have addressed the baseline hypothesis have also failed to uncover empirical support. In a study utilizing measures developed from patent data, Silverman (2002) did not find any significant relationship between entry mode and relatedness. Examining market entries with U.S. Census data between 1987 and 1992, Bryce and Winter (2009) found that the baseline hypothesis was not supported when two existing measures of relatedness are used. Busija, O'Neill, and Zeithaml (1997: 324) hypothesized that the mode of entry and the type of diversification proposed by Rumelt (1982) (related-constrained, related-linked, and unrelated) should not be correlated, and found no significant correlation between the two. Moreover, the pairwise correlation between entry mode and relatedness has been statistically insignificant in studies that

have reported such correlations. Sharma (1998) observed that the difference in the mean level of relatedness between the firms that entered via acquisition and those that entered via internal development could not be distinguished from zero. Similarly, Pennings, Barkema, and Douma (1994) found no significant correlations between entry mode and measures of relatedness, unrelatedness, and vertical relatedness.

Collectively, these studies point to the lack of a simple connection between entry mode and relatedness. A central argument of this paper is that the connection between entry mode and relatedness is likely to be moderated by the location of the new market—specifically, whether that market is inside or outside the firm's primary business domain. Acquisitions serve various objectives, and firms often acquire units within their primary business domain for reasons that depart from the logic of the baseline hypothesis. In a study of post-acquisition business reconfiguration, Karim and Mitchell 'found striking evidence of both resource deepening and resource extension. . . acquirers tend to use acquisitions either for close reinforcement of existing skills or for substantial jumps into new skill sets. By contrast, acquisitions may play less of a role for incremental movement away from existing skills. . . .' (Karim and Mitchell, 2000: 1079). Such findings suggest that within the firm's primary business domain, acquisitions are used mostly for resource deepening, whereas outside that domain, they are used mostly for resource extension. If acquisitions serve to reinforce the firm's existing skills, the logic of the baseline hypothesis fails to apply. Indeed, if such acquisitions are concentrated in close proximity to the firm's existing products, they will show a pattern opposite that predicted by the baseline hypothesis.

Another potential reason why prior studies have not found empirical support for the baseline hypothesis is that researchers have focused almost exclusively on the leveraging of the firm's existing resources, while ignoring the need to fill resource gaps. Utilizing excess resources serves as one motivation for entering a new product market, but another motivation is to obtain new resources that can complement the firm's existing products. Economies of scope associated with entry can arise from not only utilizing excess capacity of existing resources, but also from redeploying existing resources into new areas where they are more productive, and potentially, combining them with

new resources (Capron, Dussauge, and Mitchell, 1998; Penrose, 1959; Teece, 1980, 1982). New resources can be created from internal sources or obtained from external sources. Many options may be available for acquiring resources externally: for example, market transactions with external agents such as suppliers, contractors, inventors, and universities; alliances or joint ventures with partner companies; and the option central to this study, the full acquisition of a firm or business unit.<sup>2</sup>

In the short run, these two motivations—utilizing excess resources and filling resource gaps—may serve as different drivers of entry mode choice. If a firm is trying to apply excess resources into a new product market, and the required resources for entry can be assembled by the firm (i.e., the resources can be easily created from internal sources or obtained from external sources), the entry mode is likely to be internal development. In contrast, if a firm needs to fill a major gap in its resource base, the entry mode is likely to be acquisition of an incumbent. Yet these two motivations are complementary when viewed over time as part of a process of sequential market entry. Using acquisitions to fill resource gaps allows the firm to extend its resource base (Capron and Mitchell, 2004, 2009; Hagedoorn and Duysters, 2002). Hence, an acquisition today may facilitate future expansion via internal development, and the process of internal development may reveal gaps that can be filled via acquisitions to promote further growth of the firm.<sup>3</sup> Moreover, asset divestiture and resource redeployment may motivate acquisitions, as they are elements of a dynamic process in which firms change their businesses by recombining internal and external resources (Capron and Mitchell, 1998; Capron, Mitchell, and Swaminathan, 2001).

Researchers in industrial organization economics emphasize market power and efficiency gain as incentives for horizontal acquisitions (see Kim and Singal, 1993; Focarelli and Panetta, 2003 for

<sup>2</sup> Acquisition as entry mode is strictly defined as the purchase of an incumbent (or one of its business units) from the pool of producers operating in a target market. In contrast, internal development involves assembling the needed resources and capabilities from sources besides the incumbent pool. For a comparison between alliance and acquisition as alternative strategies for growth, see Dyer, Kale, and Singh (2004).

<sup>3</sup> In contrast, for firms in declining industries, asset redeployment (Anand and Singh, 1997; Dutz, 1989) may also serve as a resource-based motivation for acquisition.

reviews). When a firm acquires a rival that competes in the same industry, the combined firm may be able to exercise increased market power, resulting in higher product prices. The conditions under which this rise in market power can be significant have been extensively explored in economic theory. By comparison, the economic arguments that support the efficiency motive for acquisitions—gains arising from economies of scale or scope, improvements in managerial practice or production techniques, or other sources of synergies—run in parallel with the resource-based interpretations of the strategic management literature. Economists apply these market power and efficiency motives to horizontal acquisitions, which are most likely to occur inside a firm's primary business domain.

### Relative advantages of the two entry modes

Choosing between the two entry modes, a firm must consider their relative advantages and disadvantages. Acquisition and internal development are likely to differ with respect to the cost, risk, and speed of entry, and we compare the two modes along these dimensions. Then, in the next section, we consider how the trade-off may be moderated by the location of the new market (inside vs. outside the firm's primary business domain).

#### *Cost of entry*

The baseline hypothesis makes its prediction based on the relative cost of the two entry modes. Acquisitions almost always require payments of a significant financial premium (Jensen, 1993; Nielsen and Melicher, 1973; Slusky and Caves, 1991; Walsh, 1989), and typically there are further transaction costs as well as costs of integrating the acquired company with the acquiring firm (Chi, 1994; Lubatkin, 1983; Zollo and Singh, 2004). The sum of the acquisition premium, transactions costs, and integration costs can represent a considerable fraction of the business value. Therefore, acquisition tends to be a relatively expensive entry mode in most cases.

While an acquisition premium normally must be paid, the margin may in effect be reduced when the stock price of the acquiring firm is high. Thus, acquisitions are more likely to be used by firms with abundant financial resources embodied in their stock market valuation. Supporting this

idea, Chatterjee (1990) found high stock market valuation to be significantly linked to the use of acquisition as entry mode.

In addition, we note that the relative cost of the two modes depends on the type of funding. Acquisitions can be funded by various mechanisms: exchange of stock, accumulated cash reserves, debt, or some combination thereof. In contrast, for established firms, internal development is mostly funded by current cash flow (Hall, 2002). This suggests that firms with high current profitability can support internal development and would tend to emphasize that mode over acquisition. Although a high stock market valuation can be converted into cash to fund internal development, this requires an extended and potentially costly process of issuing new equity.

We also note that the cost of internal development is higher for firms with a weaker base in research and development (R&D). In technology-oriented sectors—such as telecommunications, the focus of our empirical analysis—R&D capabilities are important. R&D-intensive firms are more likely to be able to develop in-house the technologies required for entry. This implies that R&D-intensive firms would tend to emphasize internal development for market entry, whereas firms with weaker R&D skills would rely more on acquisition. Consistent with this idea, Chang and Rosenzweig (2001) and Hennart and Park (1993) found that firms with high R&D intensity are more likely to expand via internal development than acquisition. However, Chatterjee and Singh (1999) argued for but found no association between mode of expansion and a measure of knowledge-based resources.

#### *Risk of entry*

Although both modes carry risks, the overall risk associated with internal development tends to be lower for several reasons. First, internal development takes place through incremental investments that are spread across multiple transactions in a project, whereas acquisition typically involves a lump-sum commitment through a single transaction. Therefore, the losses associated with a failed acquisition are likely to be greater than those associated with a terminated internal development project. Second, acquisitions often fail to create the value expected, and they can even harm the acquiring firm's innovative capabilities (Hitt *et al.*,

1991). Hence, failed acquisitions may subject the firm's future growth to significant risks. Third, information asymmetries between the acquiring firm and candidates from the incumbent pool raise the acquiring firm's risk of overpaying or buying a 'lemon' (Akerlof, 1970), a tendency that has been well documented in the finance literature (Eckbo, Giammarino, and Heinkel, 1990; Fishman, 1989; Hansen, 1987).

Of course, internal development can pose higher risk in that the ultimate success of the venture may be less certain than for an acquired business, which is an established entity. A further risk that may be greater for internal development is competitive retaliation. While acquisition replaces the owner of an incumbent, internal development creates an additional competitor. An increase in the number of competitors has the potential to intensify competition, thereby depressing profitability. Consistent with this idea, Chatterjee (1990) and Chatterjee and Singh (1999) found a tendency for firms to enter concentrated markets by acquisition.

#### *Speed of entry*

When speed is important, acquisition is more likely to be used as the entry mode. Most acquisitions are consummated relatively quickly, whereas internal development of new products or services normally takes many months or years. Acquisition may allow the acquiring firm to realize revenue earlier, achieve scope economies faster, and capture a greater market share. When entry occurs through internal development, a decade or more is often required to fine-tune the business to achieve the profitability of established competitors (Biggadike, 1979).

#### **Inside vs. outside the firm's primary business domain**

The baseline hypothesis implies that the firm is more likely to use acquisitions when the new product market is distant from the firm's existing products. However, Karim and Mitchell (2000) show that acquisitions are also utilized close to the firm's existing products. They demonstrate that acquisitions are used for resource deepening as well as for extension, although they do not study the choice of entry mode.

We propose that the connection between entry mode and relatedness is moderated by whether the new product market is inside or outside the firm's primary business domain. For this distinction to be useful, one must be able to identify the firm's primary business domain and the specific markets that lie inside vs. outside. Many studies of corporate diversification have attempted similar distinctions using dichotomous or continuous measures (Chang and Singh, 1999; Montgomery and Wernerfelt, 1988; Rumelt, 1982; Sharma, 1998). Ultimately, all efforts to define distinct market regions are to some degree arbitrary, and our study is no exception. The exact division between core and periphery may depend on the data available for market classification.<sup>4</sup> We argue, nonetheless, that the distinction is important, even though the classification of markets at the boundary may vary from one analyst to another.

#### *Inside the primary business domain*

The baseline hypothesis implies that the firm will use internal development to enter product markets that lie close to its existing products, while relying on acquisition to expand further afield. Contrary to this hypothesis, we propose that the firm may emphasize acquisition inside its primary business domain. Karim and Mitchell's (2000: 1079) finding that firms often use acquisitions 'for close reinforcement of existing skills' and only rarely 'for incremental movement away from existing skills' suggests that within the primary domain, acquisitions are pursued close to the firm's existing products.

A key logic of the baseline hypothesis is that greater relatedness between the new product market and the firm's existing products reduces the cost of internal development. Yet this ignores the fact that relatedness also reduces the cost of acquisition. Relatedness increases a firm's absorptive capacity that 'confers an ability to recognize the value of new information, assimilate it, and apply it

<sup>4</sup> As described in the empirical section that follows, we take advantage of a hierarchical product classification system that uses a tiered structure in differentiating between fine-grained product categories. We consider an entry to be inside a firm's primary business domain if the product classification of the market in which the firm enters shares the same root of the hierarchy as the firm's primary business. Thus, we assume that market entries made by the firm within its root business category lie within the primary domain, whereas entries into other categories lie outside that domain.

to commercial ends' (Cohen and Levinthal, 1990: 128). A firm that is steeped in the relevant knowledge base is better able to recognize the value of acquisition candidates during the search process. In addition, when a firm and its acquisition candidates draw on similar knowledge bases, relatedness helps the firm to assess acquisition candidates (Coff, 1999). As such, relatedness enables a firm to better evaluate the resources and capabilities of acquisition candidates who compete inside the firm's primary business domain. Should the cost of acquiring a candidate fall below some threshold—due to a rise in the firm's own stock price or some change in the candidate's—the firm seeking entry may act opportunistically. Moreover, monitoring acquisition candidates is easier inside the firm's primary business domain through regular surveillance of competitive landscapes. These arguments imply that inside the firm's primary business domain, reduction in the costs of search, evaluation, and monitoring of acquisition candidates can make acquisition a less expensive entry mode.

In addition to such cost reduction, relatedness may reduce the risk of acquisition failure as well as the time required to integrate the acquired business entity. When relatedness enables an acquiring firm to better assess acquisition candidates, the likelihood of selecting an appropriate candidate rises, and hence, the risk of acquisition failure falls. When relatedness improves an acquiring firm's absorptive capacity, the integration time is likely to decrease.

For entries inside the primary business domain, reduced competition is an additional benefit that makes acquisition an attractive entry mode. When a firm acquires a rival that competes in the same industry, a competitor is eliminated. The combined firm occupies a larger share in markets where the acquiring and acquired firms overlap, potentially resulting in increased market power. Even in the absence of overlap, acquisitions may serve as preemptive strikes in a form of entry-detering investment commitment (cf. Gilbert and Lieberman, 1987).

These arguments imply that proximity to a market may reduce the cost, risk, and time associated with acquisition, and may also benefit the firm by mitigating competition. This leads to a prediction that is the reverse of the baseline hypothesis, that is:

*Hypothesis 1b: In a firm's primary business domain, the more related a new product market is to the firm's existing products, the more likely the use of acquisition as entry mode.*

Furthermore, acquisition becomes more likely if the firm has been close to the new market for a long period of time but has not entered. A longer duration may give the firm more information about acquisition candidates, thereby enhancing some of the benefits discussed above. Moreover, a long duration suggests that entry may be impeded by gaps between the firm's resources and those needed to enter the market through internal development (Helfat and Lieberman, 2002). For example, the firm may lack key technology, or it may be blocked by patent barriers. When resource gaps are persistent, the reductions in cost, risk, time, and competition make acquisition a particularly attractive entry mode. Therefore, we hypothesize that acquisition is more likely when the firm has been in close proximity to the new market for an extended period.

*Hypothesis 2: In a firm's primary business domain, the longer the duration of relatedness between a new product market and the firm's existing products, the more likely the use of acquisition as entry mode.*

#### *Outside the primary business domain*

While cost, risk, and time delay are always central to the choice of entry mode, we argue that the underlying drivers of entry mode decisions are different for product markets outside a firm's primary business domain. Firms often pursue a dynamic path of expansion to leverage their resources outside the primary business domain. For example, the firm may take resources from the primary domain and position them outside to establish a beachhead in a new business area. The firm may then build upon this base to develop a set of related products outside the primary domain, using both internal development and acquisition. To cite one case from our sample, AT&T used its expertise in telecommunications software to establish (through internal development) a stand-alone software-based product (AT&T Easylink Services) outside the company's telecommunications core. AT&T then made

a series of acquisitions to launch into product markets beyond the new base, while using internal development to gradually expand its portfolio of software products.<sup>5</sup>

Even though the firm may have a strategy to leverage its existing resources outside the primary domain, it typically lacks many complementary resources necessary to build the new products through internal development. Once acquired, however, the new resources may be combined with the firm's existing resources to allow further expansion. Much of this growth may be through internal development into markets that are close to where the firm has already established operations in the new area, having entered initially through either acquisition or internal development.

While such a process of expansion is consistent with the baseline hypothesis, that hypothesis is static. We posit that outside their primary business domain, firms tend to expand along trajectories, utilizing acquisitions to stretch into new markets that may be relatively far from their existing products. Reflecting these ideas, we hypothesize that acquisitions provide a means to extend the firm's trajectory.

*Hypothesis 3: Outside a firm's primary business domain, the more related the firm's existing products and the new product market have become over time, the more likely the use of acquisition as entry mode.*

Hypothesis 3 indicates that prior movement by the firm in the direction of a market leads to higher use of acquisition for entries into that market. Combining Hypothesis 3 with Hypothesis 1a gives the prediction that the firm will use acquisitions to enter a market far from the firm's existing products that the firm has been approaching. Although the new market may still be distant, the more a firm has leaped toward the market, the more likely that acquisition will be used as entry mode. Thus, joint support for Hypothesis 1a and Hypothesis 3 suggests a trajectory with leaps in relatedness. (Note that while Hypothesis 3 adds an element of dynamics to the baseline hypothesis, its direction runs counter to that hypothesis: Hypothesis 1a, taken

alone, implies that the likelihood of acquisition *falls* as the firm approaches the new market.)

Furthermore, we speculate that compared with acquisitions within the primary business domain, acquisitions made outside are likely to be more strategic and less sensitive to the firm's current level of financial resources. If this is the case, our empirical work should reveal minimal association between choice of entry mode and the firm's current stock price and cash flow.

## RESEARCH METHODS

### Dynamic measures of firm-market relatedness

We gauge the relatedness between a firm's existing products and its new product market in ways that go beyond the methods in earlier work. Following Lee's (2008) work on capability relevance, we measure relatedness by projecting a firm's overall resources and capabilities in the direction of those that are relevant with respect to a specific market. Our relatedness measures are based on the rate of joint occurrence of products within firms' portfolios in our sample. This approach, similar to Teece *et al.* (1994), Bryce and Winter (2009), and Lee (2007, 2008, 2009), offers attractive features for strategic management research but has rarely been applied. We innovate upon this approach by capturing the dynamics of relatedness along three dimensions.

Existing measures of relatedness used in studies of corporate strategy have been of two main types. The first type draws from the structure of an industry classification system (typically the standard industrial classification [SIC], which is based mostly on characteristics of firm outputs). For example, a firm's primary industry and a second, target industry are considered to be more related if the firm's primary SIC code has more matching digits with the target industry's SIC code. Relatedness is then measured by the sales-weighted concentric diversification index (Chang and Singh, 1999; Sharma, 1998), the change in diversification after entry (Chatterjee, 1990), or the type of diversification (Busija *et al.*, 1997). The second type of measure draws from data on firm inputs. Studies of this type emphasize the resource similarity between a firm and the target industry average. A firm's industry and a class of industry are considered to be more related if the intensity of resource

<sup>5</sup> Using acquisitions, AT&T entered communications control software, expert systems, and electronic message systems software. Using internal development, AT&T built security/auditing software, extensions to word processing packages, and software to reorder data files.

utilization is more similar. Measures have been based on occupational categories (Farjoun, 1994; Coff, 1999), patents (Silverman, 1999), and other resource inputs such as R&D, advertising, and capital expenditures (Chang and Singh, 1999).

In comparison, our relatedness measures have three unique features. First, our measures do not rely on any hierarchical structure, and therefore they are conceptually distinct from the inside/outside domain division in our study. Unlike the concentric diversification index, we do not combine relatedness and percentage of a firm's sales in each business into a single measure. Second, we infer resource similarity from the industrywide rate of joint occurrence of products within firms' portfolios. By examining what firms actually produce, this approach eliminates the need to specify the precise basis of similarity between any two products, since it is inferred directly from the extent to which actual economic activity combines pairs of products. This makes our relatedness measures more generalizable compared to measures of relatedness that rely solely on firm input. Third, we track changes over time in the relatedness between the firm and the new market in ways that go beyond the static measures used in prior work. This allows us to examine the baseline hypothesis with longitudinal data, thereby capturing elements of dynamics that have been missing in earlier studies.

Specifically, we compute three measures that are updated annually in our sample: the *degree*, the *duration*, and the *trajectory* (change in degree) of relatedness. The 'degree of relatedness' is a measure of current relatedness; it reflects the distance between the new market and the closest product currently in the firm's portfolio. The 'duration of relatedness' gives the period of time for which the degree of relatedness has been greater than zero, while the 'trajectory of relatedness' gives the net change from the initial greater-than-zero value (i.e., the extent to which the firm has approached or moved away from the new market). Taken together, these measures provide a rich and dynamic characterization of business relatedness, as described in greater detail below.

### Data sources

We take advantage of a unique dataset that contains longitudinal information on a firm's products. The data source is the CorpTech product data index

'Who Makes What' in the telecommunications industries, available in the *CorpTech Directory of Technology Companies* published annually starting in 1986 by Corporate Technology Information Services of Wellesley Hills, MA. The entities listed in the directory are located in the United States, and they cover domestic- and foreign-owned, public and private, parent companies, subsidiaries, and divisions. The index provides detailed product listing by entity, product code, and year.

Compared to the data sources used in other technometric studies, the CorpTech directory provides much more fine-grained classifications of products and services providing a richer and more complete picture of each industry segment. As a point of comparison, the CorpTech directory has 2,991 unique product codes, mapping to 218 four-digit SIC codes. Although research on diversification has typically relied on the SIC system in examining the relationship between corporate activities, the distinction between activities even at the four-digit level is often too coarse. For instance, 324 CorpTech product codes would not be distinguishable because they are all classified under the same four-digit SIC code 7372: prepackaged software.

The CorpTech data are frequently updated (63% of the records are verified within one year of the publication date) via telephone interview (66% of the records) and written communication (34%). In addition to product listing, the data also cover information on a firm's primary business domain, employee head count and founding year. To gather further information pertaining to annual sales, profitability, ratio of market-to-book value, and R&D expenditure, we matched the publicly-traded firms listed in the CorpTech directory with the firms listed in Standard & Poor's Compustat database.

### Methodology

First, we draw a sample of firms where each firm has consecutive years of observation for at least nine years and up to fifteen years. For each firm and each year of observation, we compile the product portfolio of the firm and its acquirees. These continuous observations enable the construction of a firm's event history in market entry by comparing its portfolio from year to year. In contrast to product-line extensions within previously served markets, new business development results in new products that are distinct enough to warrant



Dynamic measures of the firm-market relationship:

$$R_{nx}(t) \equiv \text{firm } n\text{'s proximity toward market } X \text{ in year } t$$

For each market  $X$  entered by firm  $n$ , we compute three measures of relatedness between market  $X$  and the closest product within firm  $n$  in year  $t$

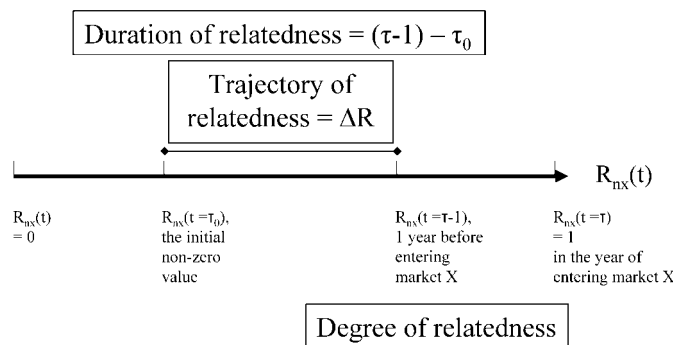


Figure 1. The degree of relatedness, duration of relatedness, and trajectory of relatedness

new classifications within a relatively fine-grained classification scheme. In addition, the continuous observations permit us to trace the mode with which each product is added to the portfolio. We identify a firm to enter market  $x$  in year  $t$  when product code  $x$  appears in the firm’s portfolio for the first time in year  $t$ , and remains listed in year  $t + 1$ . This two-year requirement ensures that the new codes are not unwanted businesses, acquired as part of a multibusiness bundle but quickly spun off. (We also tested a three-year requirement as a robustness check.) We consider the entry to be via acquisition when the product code  $x$  can be traced through corporate ownership change to a producer of  $x$  in year  $t - 1$ .<sup>6</sup> Our sample of 163 publicly-traded firms made 1,719 market entries across 657 markets over the 15-year period of the sample.

<sup>6</sup> Our study improves upon prior work by identifying entry events and their mode of entry with higher precision. We identify entry via acquisition under a strict condition that an acquirer’s new product code in the year of entry can be traced to an acquiree’s product listing in the year prior to the acquirer’s entry event. The detailed tracing is possible because the product classification system we use is much more fine-grained than the SIC system. In comparison, some studies suffer from an ‘all or nothing’ bias where all diversification moves under one SIC code are assigned to either acquisition or internal expansion arbitrarily (Chatterjee, 1990). Others suffer from another type of aggregation bias where the entry mode is measured as a continuous variable indicating the dominance of one mode in sales contribution over an arbitrary time period, as opposed to the mode of entry specific at the firm-market level (Chatterjee and Singh, 1999).

Next, we analyze intermarket relationships by constructing a pairwise similarity index with 1,489 product markets in which an aggregate of 11,479 firms participate in year 2003. If the firms that produce product  $A$  almost always produce product  $B$ , we assume that supply- and/or demand-side complementarities exist between the two products. By examining the frequencies with which products co-occur in firms’ product portfolios, we rank a list of products according to their similarity with respect to each focal product. Then, as described below, we use the intermarket similarity index and a firm’s annual product portfolio to measure a firm’s proximity toward each market as a function of time. Finally, we use the time-varying proximity to construct three measures of the firm-market relationship in estimating a firm’s choice of entry mode (see Figure 1).

**Measures**

*Entry mode*

We code firm  $n$ ’s entry mode to market  $x$  in year  $t$  as one if the new product code  $x$  can be traced through corporate ownership change, namely that the product is acquired from an incumbent; zero otherwise. In the case where one of the firm’s existing divisions or subsidiaries also adds product code  $x$  in the same year as the acquisition, we cannot rule out the possibility that the firm may use both internal development and acquisition to

enter market  $x$ . Therefore, we make a conservative assumption to favor false negatives and code the case as entry via internal development. The results are robust when the observations under the special case are recoded as missing or as all acquisitions.

#### *Inside/outside primary business domain*

We classify each firm's primary business domain according to the root categories of CorpTech's hierarchical product classification structure. The primary business domain of most firms in our sample is TEL-telecommunications (43%). Other primary business domains include SUB-sub-assemblies and components (13%), COM-computer hardware (12%), SOF-computer software (5%), DEF-defense (5%), and others.

We distinguish entries inside a firm's primary business domain from those outside by comparing the root category of a product market and the category of a firm's primary business domain. Using this classification scheme, we identify a total of 540 entries inside and 1,179 outside made by the 163 firms in our sample. These firms enter a total of 287 markets inside their primary business domains and 549 outside over the period between 1989 and 2003. For firms whose primary business domain is TEL-telecommunications, 51 percent of their entries are inside the primary. Of the entries outside the primary, they span many industries across SOF-computer software (33%), SUB-subassemblies and components (18%), COM-computer hardware (16%), PHO-photonics (8%), TRN-transportation (6%), TAM-test and measurement (6%), and others.

#### *Pairwise similarity index*

To characterize the intermarket relationships, we create a pairwise similarity index for each product  $x$ . The construction starts with a  $Q$  by  $M$  matrix, where  $Q$  is the number of products produced by a population of  $M$  firms in the year 2003. Let  $P_i$ , a row vector in the  $Q$  by  $M$  matrix, indicate the presence or absence of product  $i$  across  $M$  firms. Also, let  $P_x$ , a row vector in the  $Q$  by  $M$  matrix, indicate the presence or absence of the focal product  $x$  across a population of  $M$  firms. The similarity index,  $S_{ix}$ , is a measure of product  $i$  and product  $x$ 's frequency of joint occurrence within a firm.  $S_{ix}$  is calculated as the angular

separation between the two vectors:

$$S_{ix} = \frac{P_i \bullet P_x}{|P_i| |P_x|} = \frac{\sum_{m=1}^M P_{im} P_{xm}}{\sqrt{\sum_{m=1}^M P_{im}^2} \sqrt{\sum_{m=1}^M P_{xm}^2}} \quad (1)$$

$S_{ix}$  is equal to one when  $i$  and  $x$  have identical patterns of joint occurrence across  $M$  firms.  $S_{ix}$  is zero when  $i$  and  $x$  do not co-occur at all. The higher the  $S_{ix}$  is, the more similar the two products are. In essence, the similarity index is the normalized count of firms that produce both product  $i$  and product  $x$ . If a firm in  $M$  is also among the 163 in our sample used in estimating the choice of entry mode, the firm's products are removed when constructing the similarity index for the given firm.

#### *Degree of relatedness*

We define the degree of relatedness as the distance between the market entered and the market in which the firm currently operates that is closest to the market entered. We measure a firm's degree of relatedness by taking the maximum value of the pairwise similarity index among a firm's products each year with respect to the market entered. We denote the degree of relatedness as  $R_{nx}(t)$ , capturing firm  $n$ 's proximity toward market  $x$  in year  $t$ . The higher the value of  $R_{nx}(t)$ , the better the match is in resources and capabilities and/or product line economies of scope between a firm's state in year  $t$  and the entry requirements. In estimating entry mode, we use the degree of relatedness observed one year prior to market entry.

#### *Trajectory of relatedness*

The value of  $R_{nx}(t)$  changes as firm  $n$  adds (drops) products to (from) its portfolio. To measure the change in  $R_{nx}(t)$ , we subtract the initial greater-than-zero value of  $R_{nx}$  from the value of  $R_{nx}$  one year prior to entry. When the difference in  $R_{nx}(t)$  is positive, the change shows firm  $n$ 's movement toward market  $x$ . In contrast, when the difference is negative, the change shows the firm's movement away from market  $x$ . When the difference is zero, there is no change with respect to market  $x$ .

*Duration of relatedness*

We measure the duration of  $R_{nx}(t)$  as the amount of time, in years, that elapsed since the initial observation of a greater-than-zero value of  $R_{nx}(t)$  until one year before firm  $n$  enters market  $x$ . The longer the duration, the more time firm  $n$  is in the vicinity of market  $x$  (although the degree of relatedness may vary over time). We also create a dummy variable to indicate cases of left censoring where firm  $n$ 's duration of relatedness is one year but that is the first year of observing firm  $n$  in the sample. Our findings remain robust when the dummy variable is added to correct for censoring in the early years of the sample.

*Financial and technical resource measures*

We employ several measures to capture the strength of the firm's financial resources: profitability, market-to-book value, firm size, and firm age. Prior studies argued that firms with more internal financial resources are more likely to use internal development as entry mode (Chatterjee, 1990; Chatterjee and Singh, 1999; Hennart and Park, 1993). However, the measure of internal financial resources used in these studies, namely the ratio of long-term debt to market value, is shown to either have no significant correlation with entry mode (Hennart and Park, 1993: 1063), or predict internal development in some cases (Chatterjee, 1990: 794) but acquisition in others (Chatterjee and Singh, 1999: 37). Therefore, we use a set of variables that are more likely to correlate with the availability of internal financial resources, including profitability (return on sales, [ROS]), firm size (net sales), and firm age (the number years since founding). We restrict the minimum ROS to be zero, because of outliers.

Prior studies have also offered contradicting arguments regarding the effect of external financial resources on entry mode. Some have argued for and found an association between stock price and the use of acquisition as entry mode (Chatterjee, 1990). Others have argued for the association between stock price and internal development but found contradicting results (Chatterjee and Singh, 1999: 30, 37). We use the ratio of market-to-book value, which we expect to be positively correlated with acquisition.

Prior studies have also incorporated measures of technological resources and made conflicting arguments regarding the association between research

intensity and entry mode. Our study uses R&D intensity, measured as the ratio of R&D expenditures to sales in the year prior to entry. We expect this measure to be negatively correlated with the use of acquisition. Because of outliers (a few firms experienced a sharp decrease in net sales in certain years), we restrict the maximum R&D intensity to be 100 percent.

*Market-level controls*

We include two control variables relating to characteristics of the focal market: newness and density. We control for market newness because when the new market is growing rapidly, the opportunity cost of internal development may be higher than that of acquisition. In such markets, firms may choose acquisitions over internal development in order to speed their rate of entry. Market newness is a categorical variable taking the value of one if the market emerged in the 1990s; zero otherwise. We control for market density because when the incumbent pool is small, the number of potential acquisition candidates is restricted, thus making it difficult for firms to acquire. At the same time though, firms may prefer acquisition to avoid raising the number of competitors in a still-concentrated market. Market density is the number of incumbent firms operating in the market in the year prior to entry. Because market density is highly skewed across markets, we take the natural log.

**Regression model**

The estimation of a firm's choice of entry mode is based on a standard logistic regression model:

$$P = \frac{1}{1 + e^{-(\beta X)}} \quad (2)$$

The dependent variable is defined as one in cases of entry via acquisition, and zero when the entry mode is internal development. The probability,  $P$ , is modeled as a logistic distribution function where  $X$  includes the characteristics of the firm, the characteristics of the focal market, and the dynamic measures of the firm-market relationship. The estimated coefficients are  $\beta$ . The independent variables are taken one year prior to the entry event to ensure proper inference of causality.

Table 1. Summary statistics and pair-wise correlations (1,719 observations)

Variable	Mean	Std. Dev.	Min.	Max.
(1) Entry mode: 1 = acquisition; 0 otherwise	0.23	0.42	0	1
(2) Where the new market resides: 1 = inside; 0=outside a firm's primary business domain	0.31	0.46	0	1
(3) Degree of relatedness, 1 year prior to entry	0.17	0.13	0	1
(4) Trajectory of relatedness: amount of change in degree of relatedness	0.04	0.09	-0.33	0.77
(5) Duration of relatedness, years	6.26	3.44	1	13
(6) Research intensity: R&D expenditure divided by net sales	0.08	0.08	0	1
(7) Internal financial resources: a firm's profitability measured as return on net sales	0.05	0.05	0	0.32
(8) External financial resources: a firm's ratio of its market-to-book value	2.42	3.19	0.24	39.08
(9) Size: net sales (million USD), divided by 1,000	11.70	24.70	6.00e-06	168.92
(10) Age: number of years since a firm's founding	47	31	3	137
(11) Market newness: 1 if the new market emerged after 1990; 0 otherwise	0.15	0.35	0	1
(12) Market density: count of incumbents in the new market prior to entry	71	297	1	4772

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)	1											
(2)	-0.04	1										
(3)	0.03	0.07	1									
(4)	0.08	-0.01	0.59	1								
(5)	0.11	-0.02	0.19	0.30	1							
(6)	-0.10	0.18	-0.08	-0.04	0.004	1						
(7)	-0.09	0.02	-0.01	0.03	0.10	-0.07	1					
(8)	-0.003	0.16	-0.08	-0.01	0.09	0.40	0.34	1				
(9)	0.10	-0.15	0.01	0.13	0.27	-0.17	-0.01	-0.07	1			
(10)	0.06	-0.24	0.11	0.06	0.23	-0.30	0.02	-0.20	0.52	1		
(11)	0.03	-0.001	0.01	0.11	0.17	0.07	0.01	0.15	0.08	-0.02	1	
(12)	-0.002	0.05	0.01	0.16	0.16	0.16	-0.06	0.06	0.01	-0.04	0.31	1

\* Correlations equal to or greater than |0.05| are significant at 5%.

**RESULTS**

Table 1 shows the summary statistics of the variables and the pairwise correlations. Among the 1,719 entry events observed, 394 have acquisition as the entry mode; that is, 23 percent of the entry events have acquisition as the entry mode, confirming that internal development is more popular. When we analyze where the new markets reside, we find that 31 percent of the entry events occur inside a firm's primary business domain. We also find that, of the 540 entries inside a firm's primary business domain, internal development is the entry mode for 430 (80%). In comparison, of the 1,179 entries outside, internal development is the entry

mode for 895 (76%). Thus, acquisition was used at about the same rate for entries inside and outside the primary business domain, and the correlation between entry mode and the inside vs. outside distinction is not statistically significant.

Table 2 reports the results of logistic regression based on the full sample of entry events. Neither of the market-level control variables that address characteristics of the new market is statistically significant.<sup>7</sup> However, most variables denoting the

<sup>7</sup>In addition to using the natural log of market density, we also tested the simple count of firms, which was not significant in the regression. This suggests that neither the intensity of competition, nor the size of the pool of potential acquisitions, explains the probability of using acquisition as entry mode in

Table 2. Estimating the use of acquisition as entry mode (robust standard errors in parentheses)

	(2-1)	(2-2)	(2-3)	(2-4)	(2-5)	(2-6)
<b>Measures of firm-market relatedness</b>						
Degree of relatedness	0.252 (0.474)			-0.273 (0.632)	-2.148* (0.846)	-2.215* (1.112)
Trajectory of relatedness		0.868 (0.572)		1.038 (0.775)	2.757** (1.018)	0.051 (1.435)
Duration of relatedness			0.031 (0.035)	0.023 (0.035)	-0.012 (0.039)	-0.113 (0.140)
<b>Where the new market resides: inside vs. outside a firm's primary business domain</b>						
1 = inside; 0=outside a firm's primary business domain	-0.030 (0.133)	-0.023 (0.133)	-0.035 (0.133)	-0.024 (0.133)	-0.141 (0.145)	-0.145 (0.196)
Degree of relatedness x inside					4.614** (1.189)	3.546* (1.549)
Trajectory of relatedness x inside					-3.221* (1.640)	-1.043 (2.157)
Duration of relatedness x inside					0.126** (0.042)	0.115* (0.052)
<b>Financial and technical resources</b>						
Research intensity	-0.054** (0.012)	-0.053** (0.012)	-0.054** (0.013)	-0.053** (0.013)	-0.052** (0.013)	0.002 (0.034)
Return on net sales	-7.601** (1.632)	-7.581** (1.633)	-7.566** (1.631)	-7.550** (1.638)	-7.806** (1.668)	-11.524** (2.493)
Market-to-book value	0.076** (0.021)	0.075** (0.020)	0.073** (0.021)	0.073** (0.021)	0.076** (0.021)	0.030 (0.048)
Net sales (million USD, divided by 1,000)	0.006** (0.002)	0.006* (0.002)	0.005* (0.002)	0.005* (0.002)	0.004+ (0.002)	-0.007 (0.020)
Age (divided by 100)	-0.016 (0.218)	0.003 (0.215)	-0.069 (0.231)	-0.032 (0.235)	0.020 (0.239)	18.864 (14.213)
<b>Market-level controls</b>						
Market newness	-0.007 (0.165)	-0.020 (0.166)	-0.004 (0.165)	-0.020 (0.166)	-0.064 (0.168)	-0.127 (0.221)
Market density (natural log)	0.001 (0.043)	-0.003 (0.041)	-0.007 (0.041)	-0.011 (0.044)	-0.017 (0.045)	-0.039 (0.060)
Constant	-1.263** (0.265)	-1.234** (0.266)	-1.005** (0.397)	-1.034** (0.397)	-1.080** (0.402)	
Log pseudo-likelihood	-886	-885	-886	-885	-871	-471
Chi squared test	70.03**	72.32**	70.53**	73.00**	90.15**	49.46**

+ significant at 10%; \* significant at 5%; \*\* significant at 1%.

Left-censoring dummy and time trend are included in all models, but not shown.

Models (2-1) to (2-5): Logistic regression; number of firms: 163; number of markets: 657; number of entry events: 1719; number of entries via acquisition: 394 (23%); number of entries via internal development: 1325 (77%).

Model (2-6): Conditional (fixed-effects) logistic regression; number of firms: 49; number of markets: 504; number of entry events: 1039; number of entries via acquisition: 390 (38%); number of entries via internal development: 649 (62%).

financial and technical resource base of the firm are found to be highly significant determinants of entry mode.<sup>8</sup> With regard to financial resources,

our sample. Our main results remain robust to these alternative specifications.

<sup>8</sup> As mentioned earlier, truncation was applied to the measures of profitability (restating all negative values to zero) and R&D

Table 2 shows that firms with higher profitability are less likely to use acquisition as the entry

intensity (removing two extreme outliers). Without these adjustments, size was the only resource measure that proved significant in the regressions. While truncation of the profitability and R&D intensity measures is justified on conceptual grounds, its application has virtually no effect on the main results for firm-market relatedness.

mode. This is consistent with our earlier discussion that higher cash flow supports a greater reliance on internal development. By comparison, firms with financial resources in the form of a high stock market valuation (market-to-book ratio) are more likely to rely on acquisition. Again, this is consistent with the idea that financial resources in the form of highly valued stock can be readily applied to make acquisitions, but are harder to channel into internal development. With regard to technological resources, Table 2 shows that the higher a firm's research intensity, the more it utilizes internal development as the mode of market entry. Conversely, firms that invest less in internal R&D are more reliant on entry via acquisition, consistent with expectations.

As shown in Models 2-1 through 2-4, none of the measures of relatedness prove significant when estimated on the full sample. This finding that, on average, relatedness fails to predict entry mode, is consistent with the nonsignificant results of prior studies. In Model 2-5, we test for the moderating effect of whether an entry event is inside or outside a firm's primary business domain. Here, each of the three measures of relatedness shows a significant interaction effect. Thus, the effect of relatedness on entry mode is found to depend on whether the new market is inside or outside the firm's primary business domain.

We further investigate the inside vs. outside distinction by estimating the choice of entry mode with two subsamples, corresponding to entries inside a firm's primary business domain and entries outside (see Table 3). Splitting the sample in this way may be preferable to estimating interaction effects, as the latter can be difficult to interpret quantitatively in a logit model (Hoetker, 2007). The split improves the overall significance of the model, according to the likelihood ratio tests (Model 2-5 vs. Models 3-2 and 3-4,  $p < 0.05$ ).

The regression results based on the split samples are consistent with the patterns based on the full sample with interaction effects. For entries inside the primary business domain, the mean values of the relatedness measures for the degree, trajectory, and duration are 0.185, 0.042, and 6.17, respectively. For entries outside the primary business domain, the mean values of the relatedness measures for the degree, trajectory, and duration are 0.164, 0.044, and 6.31, respectively. Results from the t-test show that the two subsamples

are statistically distinct in the degree of relatedness, but not in the other two measures of relatedness.

The split sample estimates confirm that the determinants of entry mode are different when the entries are inside vs. when they are outside. For entries inside, the significant determinants are degree of relatedness and duration of relatedness (Model 3-2). For entries outside, the significant determinants are degree of relatedness and trajectory of relatedness (Model 3-4). Perhaps most interesting, degree of relatedness has opposite effects on the choice of entry mode depending on whether the entry is inside or outside. Specifically, for entries inside the firm's primary business domain, the firm is more likely to use acquisition as entry mode when degree of relatedness is higher (i.e., acquisition is more likely when the new product market is close to at least one existing product of the firm). This supports Hypothesis 1b. However, for entries outside the firm's primary business domain, the firm is more likely to use acquisition as entry mode when degree of relatedness is lower. This supports Hypothesis 1a. Thus, the baseline hypothesis is supported, but only under the condition that the new market is outside the firm's primary business domain. In addition, duration of relatedness has a positive effect on the probability of using acquisition for entries inside, providing support for Hypothesis 2. In comparison, trajectory of relatedness has a positive effect on the probability of using acquisition for entries outside, providing support for Hypothesis 3.

This contrast between inside and outside the firm's primary business domain is apparent when the coefficient estimates are illustrated graphically. As shown in Figure 2-1, the degree of relatedness has a positive effect when the entries are inside, but a negative effect when the entries are outside. Additionally, as shown in Figure 2-2, the trajectory of relatedness has a stronger effect on the use of acquisition as entry mode when the entries are outside than when the entries are inside. In other words, outside the firm's primary domain, acquisition tends to be used for entries that are distant from the firm's existing products, but in a location that the firm has been approaching over time. Moreover, as shown in Figure 2-3, the duration of relatedness has a stronger effect on the choice of entry mode when the entries are inside than when the entries are outside. Inside

Table 3. Estimating the use of acquisition as entry mode inside vs. outside a firm's primary business domain (robust standard errors in parentheses)

	(3-1)	(3-2)	(3-3)	(3-4)
	<b>Inside firms'</b> <b>primary business domain</b>		<b>Outside firms'</b> <b>primary business domain</b>	
<b>Measures of firm-market relatedness</b>				
Degree of relatedness		<b>3.048**</b> (0.982)		<b>-2.503**</b> (0.878)
Trajectory of relatedness		-0.860 (1.464)		<b>2.993**</b> (1.032)
Duration of relatedness		<b>0.189*</b> (0.075)		-0.023 (0.042)
<b>Financial and technical resources</b>				
Research intensity	-0.062** (0.018)	-0.057** (0.018)	-0.055** (0.018)	-0.054** (0.018)
Return on net sales	-13.262** (4.117)	-14.686** (4.185)	-3.234+ (1.884)	-3.193+ (1.819)
Market-to-book value	0.139** (0.036)	0.149** (0.035)	-0.003 (0.036)	-0.012 (0.037)
Net sales (million USD, divided by 1,000)	0.026** (0.009)	0.020* (0.010)	0.005* (0.002)	0.003 (0.002)
Age (divided by 100)	0.079 (0.554)	-0.432 (0.623)	-0.298 (0.239)	-0.118 (0.268)
<b>Market-level controls</b>				
Market newness	-0.214 (0.333)	-0.358 (0.333)	0.075 (0.193)	0.036 (0.195)
Market density (natural log)	-0.051 (0.086)	0.034 (0.090)	0.013 (0.048)	-0.035 (0.052)
Constant	-1.574* (0.621)	-0.245 (0.811)	-1.019** (0.304)	-1.180* (0.472)
Log pseudo-likelihood	-236	-229	-631	-636
Wald statistic	46.10**	63.91**	36.82**	27.89**

+ significant at 10%; \* significant at 5%; \*\* significant at 1%.

Left-censoring dummy and time trend are included in all models, but not shown.

**INSIDE:** Number of firms: 129; number of markets: 287; number of entry events: 540; number of entries via acquisition: 110 (20%); number of entries via internal development: 430 (80%).

**OUTSIDE:** Number of firms: 128; number of markets: 549; number of entry events: 1179; number of entries via acquisition: 284 (24%); number of entries via internal development: 895 (76%).

the primary domain, acquisitions are more likely when the firm has been close to the new market for a longer period of time.

The split sample estimates in Table 3 also show differences in the impact of the financial resource measures inside vs. outside the firm's primary business domain. In particular, current profitability and the stock price ratio are highly significant only for entry mode decisions within the firm's primary business domain. This is consistent with our conjecture that, within their primary domain, firms often make acquisitions opportunistically when their stock price is high, but when expanding outside, they are less sensitive to financial considerations.

To summarize, our findings help to resolve the empirical puzzle on relatedness and choice of entry mode. We find that the 'baseline hypothesis' (use acquisition when the new product market is more distant from the firm's existing products) is supported only for expansions outside the firm's primary business domain. Within the primary domain, firms tend to act counter to the baseline hypothesis. In terms of dynamics, our findings suggest that within their primary domain, firms use acquisitions to fill persistent gaps, whereas outside that domain, firms turn to acquisitions to extend a trajectory of recent market entries made by the firm. Overall, the determinants of entry mode appear substantially different depending on

whether entries are inside vs. outside the primary business domain.

In addition to these findings on relatedness, the results also suggest that the choice of entry mode is affected by the nature and magnitude of the firm's resource base. Firms that are R&D-intensive emphasize internal development as their entry mode. Furthermore, financial resources in the form of current profitability and stock market valuation appear to have strong opposing effects on mode, but only within the firm's primary business domain.

### Robustness checks

We performed a number of tests to confirm the robustness of our statistical findings. First, we tested the sensitivity of our results to the time period required for a product code to remain in an acquiring firm's portfolio in order to qualify as an entry event. Increasing the requirement from two to three years had little effect on the estimates, although the resulting 21 percent reduction in sample size made some coefficients less significant statistically.

Second, we addressed possible measurement errors associated with duration of relatedness, given that the duration measure is left censored at the start of the sample. In addition to using a dummy variable to identify the left-censoring cases, we omitted observations from early years of the sample, where the left censoring is most serious. Omitting the initial four years of our sample did not affect the results. We also found that adding a time trend as a control variable had no substantive effect.

Third, we controlled for firm-specific effects, using the conditional fixed effect specification for the logistic regression. Fixed firm effects could arise for various reasons; for example, a firm that developed specialized capabilities for integrating acquisitions would have a preference for acquisition as entry mode (Helfat and Lieberman, 2002). The results are presented in Model 2-6. The coefficients for degree and duration of relatedness remain statistically significant and show little change in magnitude compared with Model 2-5. However, coefficients for the trajectory of relatedness and R&D intensity fall in magnitude and lose statistical significance, presumably as the consequence of the large reduction in sample size and elimination of interfirm variation. (Because

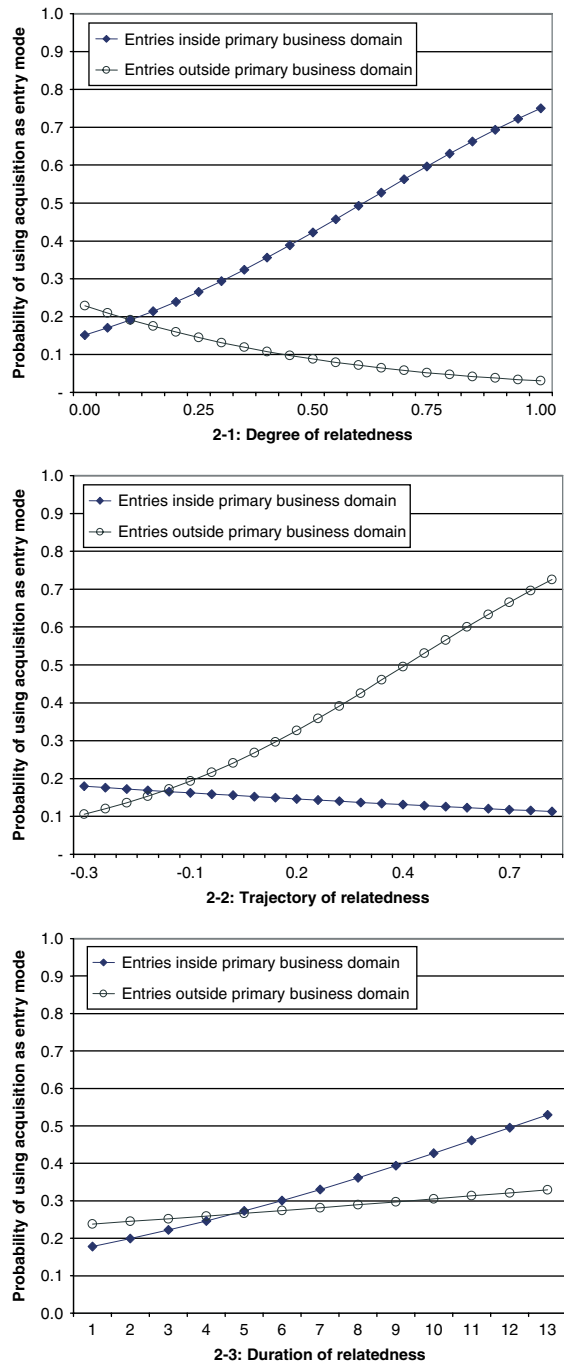


Figure 2. Probability of using acquisition as entry mode. This figure is available in color online at [www.interscience.wiley.com/journal/smj](http://www.interscience.wiley.com/journal/smj)

the conditional fixed effect specification requires each firm to have at least two observations where the dependent variable reflects different outcomes,



46% of the observations are dropped, and the number of firms in the sample is reduced from 163 to 49.)

## DISCUSSION AND CONCLUSION

This study has addressed a long-standing empirical puzzle in the relationship between entry mode and firm-market relatedness. Taking advantage of a longitudinal, fine-grained dataset, we have shown that the firm's choice of entry mode has different determinants depending on whether the new market is inside or outside the firm's primary business domain. Our results imply that the commonly asserted relationship between acquisition and unrelated diversification is supported only under the condition that the entries are outside the primary business domain. Inside the primary domain, we find the opposite relationship, that is, the use of acquisition increases with the degree of firm-market relatedness.

Such findings suggest that the choice between acquisition and internal development follows a different logic inside vs. outside the firm's primary business domain. The findings are consistent with Karim and Mitchell's (2000) conclusion that acquirers tend to use acquisitions either for close reinforcement of existing skills or for substantial jumps into new skill sets. The fact that our measures for both the *degree* and the *duration* of relatedness prove significant inside a firm's primary business domain suggests that acquisitions are used to fill persistent gaps near the firm's existing products. Similarly, our finding of significance for the *degree* and the *trajectory* of relatedness outside a firm's primary business domain implies that acquisitions are also used to stretch the enterprise in new directions.

Thus, our findings support the idea that acquisitions enable two different processes of expansion. The organizational learning literature draws a distinction between processes of exploitation and exploration in sustaining the growth of the firm (March, 1991). One interpretation of our findings is that within the primary business domain acquisitions are used largely for exploitation, whereas outside this domain they support exploration by the firm.

Our gap-based explanations may also contribute toward a more complete understanding of the choice of entry mode. Although we do not observe

resource gaps directly, our results suggest that for entries inside the firm's primary domain, acquisitions are used to fill persistent gaps in the firm's product portfolio. For entries outside, acquisitions may be used to redeploy excess resources in exploring new trajectories. Any process of effective expansion into new markets involves the leveraging of existing resources as well as the filling of resource gaps. Our findings suggest that acquisitions serve these two motives in a different way depending on whether they are located inside or outside the firm's primary business domain.

Our findings differ from those of many prior studies of entry mode. We have suggested that the differences arise for two main reasons: our use of new, dynamic measures of relatedness, and the distinction that we draw between entries inside vs. outside the firm's primary business domain. However, the differences in findings may arise from other sources. Our data are more detailed than those used in prior work, and hence our study defines markets (and firm entry) at a very fine-grained level. It is possible that findings at this level may fail to apply to a more aggregate perspective on entry. Moreover, we identify the firm's primary business domain based on the hierarchical product classifications of our data source, which applies to the telecommunications sector. Other methods of identifying primary business domains might potentially yield different results. Similarly, our findings may not apply beyond the telecommunications sector, or may apply only to technology-intensive segments of the economy.

We have limited our analysis to entries that diversify the firm's business activities within a single geographic market, namely the United States. Although not addressed in this paper, choice of entry mode is a critical issue for firms that enter foreign markets, and a large body of literature addressing this topic has emerged in the international business field. (See Chang and Rosenzweig, 2001 for a recent survey.) Foreign entrants often bring technological or marketing skills, but lack key resources relating to the foreign market. This can make partnering options, such as joint ventures and licensing arrangements (which we do not consider in this study), more attractive than the direct establishment of a fully owned subsidiary. Although such international entry decisions share features with the diversifying entry considered in the present study, the context is substantially different.

We have also limited our analysis to the choice of entry mode, ignoring broader questions on the determinants of entry. Potentially, the decision to enter a new market and the choice of entry mode are highly endogenous (Chatterjee and Singh, 1999). Also, our focus on product market entry means that we have ignored vertical integration decisions as a separate form of entry. While the vast majority of entries in our sample represent diversification moves, some include elements of vertical integration. One opportunity for future work is to integrate knowledge about modal choice across the various forms of diversifying, international, and vertical entry.

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