COMPETITION AND OVERSEAS EXPANSION: THE CASE OF TAIWANESE IT COMPANIES ENTERING CHINA

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This study investigates Taiwanese IT companies entering various geographic locations in China as influenced by their pre-entry competitive conditions. In contrast to previous research, which used to capture competitive conditions at the aggregate level of an industry, the current research captures pre-entry competitive conditions at the firm level and distinguishes between the focal firm's relationships with different competitors. This approach helps to unveil the potential asymmetry in a competitive relationship and its effect on entry decisions. Event history analysis shows that a firm is most likely to enter a new location when its competitive relationships with prior entrants there are characterized by a moderate magnitude of asymmetry. Overall, this study injects firm-centric, relationship-specific analysis into international business research on clustering behavior, thereby shedding light on 'who follows whom' as industry competitors expand overseas.

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INTRODUCTION

International business scholars have long noted that competition between firms from the same home country will influence their overseas expansion. Inspired by Knickerbocker's seminal work (1973), a significant volume of research has looked into industry competitors' propensity of following one another into the same geographic location overseas—or the spatial 'clustering' of their entry moves. Aside from other important factors such as location advantages and agglomeration economies (Dunning & Lundan, 2008), industry conditions back in the home country are considered key determinants of firms' clustering behavior. For instance, scholars have suggested that industry members are most likely to follow one another into the same location when the market concentration of their industry is modestly high; on the contrary, small-share companies in a fragmented industry may overlook one another, whereas very large companies in a highly concentrated industry may avoid engaging one another in the same overseas territory (e.g., Anand & Kogut, 1997; Delios, Gaur, & Makino, 2008; Flowers, 1976; Gimeno, Hoskisson, Beal, & Wan, 2005; Yu & Ito, 1988).

Despite progress, most studies in this line of inquiry have focused on the aggregate, structural conditions of an industry (e.g., market concentration) as behavioral antecedents, but paid only scant attention to the idiosyncratic relationships between industry competitors. Since members of the same industry typically have distinct market profiles (Peteraf & Bergen, 2003), a firm often experiences varying degrees of competitive tension from different industry members and exhibits a differential propensity of responding to their moves. In the context of overseas expansion, this intra-industry heterogeneity of competition implies that clustering behavior will be selective: that is, a firm is more inclined to follow certain industry members than others into the same location. However, since little efforts have been made to examine the relationship-specific conditions from each firm's individualistic viewpoint,

scholars' understanding of 'who follows whom' in the course of overseas expansion remains limited (Rose & Ito, 2008).

To address this gap, the current research captures pre-entry competitive conditions at the firm level and distinguishes between the focal firm's relationships with different competitors. Such a firm-centric, relationship-specific approach helps to unveil the potential asymmetry in a competitive relationship: namely, while *A* imposes a substantial competitive tension on *B*, *B* may represent merely a minor opponent to *A*. Specifically, we borrow from strategy literature the concept of competitive asymmetry. This concept was developed by strategy scholars in their attempt to provide a fine-grained description of relationships between industry competitors. Yet, although scholars have demonstrated the empirical existence of competitive asymmetry in a variety of settings (e.g., Chen, 1996; DeSarbo, Grewal, & Wind, 2006), little theoretical advancement has occurred since the concept's introduction. As a result, existing concept remains limited by a failure to consider different magnitudes of competitive asymmetry, and this concept's implications for firm behavior have been unclear. The present study refines the concept of competitive asymmetry and demonstrates its behavioral consequences. Our arguments pertain that different magnitudes of asymmetry will affect a firm's likelihood of entering a new location overseas after its industry competitors.

We test our ideas in the context of Taiwanese IT companies entering China. Due to substantial regional differences within China, we treat each province, municipality, and autonomous region as a distinct geographic location, and model a firm's propensity to enter a given location using event history analysis (Cox, 1975; Kiefer, 1988). Extending the oligopolistic reaction theory (Head, Mayer, & Ries, 2002; Knickerbocker, 1973), we theorize that a firm is most likely to enter a new location when its competitive relationships with prior entrants there are characterized by a moderate magnitude of asymmetry. Our empirical

results offer strong support for such a prediction. Overall, this study injects firm-centric, relationship-specific analysis into international business research on clustering behavior, thereby shedding light 'who follows whom' as industry competitors expand overseas.

BACKGROUND

Clustering Behavior in the Course of Overseas Expansion

Studying the pattern of firms' overseas expansion, international business scholars have long noted that industry members from the same home country often follow one another into the same geographic location, resulting in spatial 'clustering' of their entry moves. One major theory of firms' clustering behavior was first proposed by Knickerbocker (1973), who suggested that entry moves by certain industry members can threaten other members' competitive positions and trigger matching responses. Entrants into a new geographic location may benefit from unique location factors (such as skilled labor and munificent local demand), which empower them to challenge non-entrants. To avert the risk of being out-competed by prior entrants, a firm may seek to obtain access to comparable location factors by entering the same location. In other words, clustering behavior reflects a firm's attempt to secure its competitive stand relative to prior entrants.

A widely studied implication of Knickerbocker's rationale—known as the 'oligopolistic reaction theory' (Head et al., 2002)—is that clustering behavior is dependent upon pre-entry competitive conditions facing firms. Extant research used to capture competitive conditions at the industry level, relying on aggregate indicators such as market concentration ratio. For instance, a significant number of studies have shown that industry members from the same home country are most likely to follow one another into the same location overseas when the market concentration of their industry is modestly high (e.g., Anand & Kogut, 1997; Delios et al., 2008; Flowers, 1976; Gimeno et al., 2005; Yu & Ito, 1988). This is so perhaps because industry competitors are more likely to feel the effect of

one another's moves when there are just a few number of major-share firms in the industry. Nonetheless, more recent research has demonstrated that even in an oligopolistic industry, a firm tends to follow only a selected few competitors—but not others—when expanding abroad (Rose & Ito, 2008). By far, scholars have known relatively little about 'who follow whom' as industry competitors expand overseas.

In contrast to previous focus on the structural, aggregate conditions of an industry, the present research captures pre-entry competitive conditions at the firm level and distinguishes between the focal firm's relationships with different competitors. We compare each focal firm and all other industry members who have entered a new geographic location (i.e. prior entrants) in terms of their presence in various market segments in the industry.[1] Such an analysis accounts for the idiosyncratic nature of each competitive relationship. Specifically, we borrow from strategy research the concept of competitive asymmetry to characterize a firm's relationships with its industry competitors. The question investigated in this study is: how a firm's asymmetric competitive relationships with prior entrants in a new geographic location will affect its decision to enter there?

Asymmetric Competitive Relationships

In the strategy literature, a central topic concerns competitor analysis: that is, who competes with whom in an industry. Early works on this subject drew mainly from industrial organization economics (Porter, 1981; Scherer & Ross, 1990) to study competition at the industry level, assuming that all firms in the same industry are de facto competitors. Later studies refined the notion of competitors by studying strategic or competitive groups in an industry, suggesting that firms in the same group are more likely to identify one another as direct competitors (Cool & Schendel, 1987; Reger & Huff, 1993). Studies at the aggregate level of an industry or groups, while providing an essential foundation for competitor analysis,

[1] Empirically, this study delineates industry segments using distinct product categories (as listed in Appendix 1). Yet conceptually, market segments in an industry can also be defined in terms of different customer demands or technology domains (Abell, 1980; Day, 1981).

cannot fully account for intra-industry heterogeneity of competition. Hence, latest research has conducted competitor analysis at the firm level and distinguished between a firm's relationships with different industry opponents (Chen, 1996; DeSarbo et al., 2006; Peteraf & Bergen, 2003). This fine-grained analysis recognizes the varying degree of competition experienced by each firm in relation to different competitors.

A distinctive merit of the firm-centric, relationship-specific analysis is that it helps to unveil the potential asymmetry embedded in a competitive relationship. For example, while *A* imposes a substantial competitive tension on *B*, *B* may represent merely a minor opponent to *A*. Such an asymmetric relationship between industry competitors, despite being long acknowledged (Amit & Schoemaker, 1993; Carpenter, Cooper, Hanssens, & Midgley, 1988), remains largely unexplored in the literature. Research so far has only introduced the concept of competitive asymmetry and verified its empirical existence (Chen, 1996; DeSarbo et al., 2006). Yet, little theoretical advancement has occurred since the concept's introduction. As a result, the existing concept has been limited by a failure to consider different magnitudes of asymmetry, and the behavioral implications of this concept have been unclear.

The current study accounts for different magnitudes of competitive asymmetry and investigates their influence on a firm's decision to enter a new geographic location. To depict the concept of competitive asymmetry, strategy scholars have developed a few indicators. For example, Chen (1996) compared industry members' presence in multiple industry segments and their possession of various types of productive resources. Competitive asymmetry was identified through juxtaposing companies' market profiles and/or their resource endowments. Taking an alternative approach, DeSarbo, Grewal, and Wind (2006) surveyed consumers' choice sets to reveal their preferences for competing brands. Competitive asymmetry was identified as the occasion in which consumers view one company's brand as a close substitute for another's brand, but not the other way around.

For the objective of identifying and representing competitive asymmetry, these indicators are complementary and equally helpful. However, for the objective of predicting firm behavior, a highly visible indicator is more likely to have direct behavioral consequences. Managers act upon what they can see (Kiesler & Sproull, 1982). To recognize that a competitive relationship is asymmetric, managers need to evaluate the market and/or organization conditions facing their own company, estimate those conditions facing each industry competitor, and then make comparative assessment. These tasks are highly demanding for managers with limited attentive capacity (Ocasio, 1997), and may even become infeasible if managers attempt to base their assessments on clues that are difficult to obtain and comprehend. Indeed, managers are found to be rather constrained in understanding industry competitors (Clark & Montgomery, 1999; McNamara, Luce, & Thompson, 2002; Porac & Thomas, 1994). Hence, this study conceptualizes competitive asymmetry in terms of market profiles, which can be more easily observed and evaluated by managers in comparison to other indicators such as resource endowments and consumers' choice sets.

In this paper, we identify *competitive asymmetry* as the situations in which a competitor's presence in the industry segments that it overlaps with a focal firm is stronger or weaker than this firm's own presence in the shared segments. In other words, the existence of asymmetry reflects the difference in strength between a focal firm and a given competitor in the industry segments that they both operate in. Accordingly, the *magnitude* of competitive asymmetry reflects the size of the two parties' difference in market strength. Such a conceptualization reflects each focal firm's individualistic situation. Because members of the same industry often operate in different sets of market segments and have varying presence in these segments, a highly prominent competitor to one firm may appear as a minor opponent to another. In the remaining parts of this paper, we will argue and show

empirically that a firm is most likely to enter a new location when its relationships with prior entrants there are characterized by a moderate magnitude of competitive asymmetry.

HYPOTHESES

High Magnitude of Competitive Asymmetry

When managers acknowledge that their company's competitive relationship with an industry competitor is asymmetric, they may further assess the magnitude of asymmetry. In this section, we consider the situations in which prior entrants' market presence is much weaker or stronger than a focal firm, such that the less prominent party could hardly mount a challenge to the more prominent party. We expect this high magnitude of competitive asymmetry to reduce clustering behavior.

Weaker prior entrants. For a firm to react upon a competitor's overseas expansion, firm managers must first become aware of this competitor's entry move. Yet, managers are constrained by their limited attentive capacity (Ocasio, 1997). Instead of identifying and monitoring all industry competitors comprehensively, managers tend to focus their attention only on a selective few competitors who are deemed as a major threat; consequently, less prominent competitors are often neglected or ignored (Clark & Montgomery, 1999; McNamara et al., 2002; Porac & Thomas, 1994).

Among the numerous factors that affect managers' awareness, organization size has long been considered an important one. Smaller competitors may be overlooked in favor of more salient counterparts. In contrast, larger competitors are frequently perceived as more prestigious, higher-status members in their industry, increasing the likelihood that a firm will track them closely in an attempt to replicate their success (Haunschild & Miner, 1997). Larger competitors may also use their greater market power to employ predatory tactics against the focal firm (Scherer & Ross, 1990), prompting the firm to place them under closer surveillance.

Other than size, a more critical factor that affects a firm's awareness concerns a competitor's active presence in markets that are of particular importance to the focal firm (Chen, 1996; Peteraf & Bergen, 2003). Manager will perhaps pay greater attention to a smaller competitor who has some presence in their common markets than a larger competitor who is active mostly in markets that the focal firm does not serve. For example, a prominent computer company may have a strong presence in the mainframe computer market but not in the laptop computer market. From the perspective of a specialized laptop producer, this large mainframe company constitutes a smaller threat than another smaller company holding a moderate share of the laptop market. For firm managers to become aware of a competitor's move, this competitor needs to have a comparatively non-trivial presence in the markets that it shares with the focal firm.

This line of reasoning suggests that clustering behavior is less likely to occur when prior entrants into an overseas location have far inferior market presence in relation to a focal firm in their common markets. After these much weaker competitors have entered a new location, firm managers may not even notice the expansionary moves. Even if managers do notice the moves, they may see these moves as inconsequential events without careful assessments. Since lack of awareness will reduce a firm's propensity of reacting upon competitors' moves (Chen, Su, & Tsai, 2007), we expect that:

> *Hypothesis 1: A high magnitude of competitive asymmetry in relation to weaker prior entrants in a new geographic location will decrease a firm's likelihood of entering that location.*

Stronger prior entrants. In addition to lack of awareness, another important factor that can reduce clustering behavior concerns a firm's ability to benefit from following certain competitors into the same location overseas. Most studies grounded in the oligopolistic reaction theory (Head et al., 2002; Knickerbocker, 1973) have implicitly assumed that

members of an industry are equally competent in operating overseas. Under this assumption, a firm that follows its industry competitors into the same location can benefit as much as the prior entrants if the target location turns out to be promising, and will suffer no more than the prior entrants if the location turns out to be a bad destination. In both scenarios, the firm's competitive stand relative to the prior entrants remains roughly unchanged.

However, when certain competitors are far more competent in overseas operation, following them into the same location can longer help a firm to maintain its relative competitive stand. While a firm may follow these competitors into the same location overseas, it can hardly establish a comparable operation there. As such, these competitors will reap a greater benefit if the target location turns out to be promising, whereas the focal firm will be the first to be crowded out if the location turns out to be a bad destination. In both scenarios, the focal firm will be outperformed. Hence, if a firm attempts to match its competitors' expansion moves but fails to catch up, its relative competitive stand will be weakened—not sustained.

Whether a firm will be outperformed by prior entrants in a new location relates to their differential market strength. Industry competitors with stronger market presence often possess superior resources and skills, which they can leverage to assist establishing a solid operation in a new location (Caves, 1996; Kogut & Chang, 1991). On the contrary, if a firm decides to follow much stronger competitors into a new location, it will confront unfamiliar operating environment without the support of preexistent advantage, which will hurt its performance there (Hymer, 1976; Zaheer & Mosakowski, 1997). A firm in this situation can hardly compete with more prominent opponents for seizing the opportunities in the same location. Since inability to contest tends to restrict a firm from directly engaging its prominent opponents by entering the same territory (Chen & Hambrick, 1995), we expect

that a firm is less likely to enter a new location when prior entrants there have possessed substantially stronger market presence relative to the focal firm. Formally:

> *Hypothesis 2: A high magnitude of competitive asymmetry in relation to stronger prior entrants in a new geographic location will decrease a firm's likelihood of entering that location.*

Moderate Magnitude of Competitive Asymmetry

We have suggested that when prior entrants in an overseas location posses substantially weaker or stronger market presence, the lack of awareness and inability to contest will reduce a firm's likelihood of entering that location. Outside of these more extreme cases, awareness and capability are less an issue, and a firm's entry decision is mainly driven by motivational factors. In this section, we consider the situations in which prior entrants' market presence is modestly weaker or stronger than a focal firm, such that the less prominent party remains a capable contender against the more prominent party. We expect this moderate magnitude of competitive asymmetry to increase clustering behavior.

Weaker prior entrants. While managers tend to concentrate on tracking more prominent competitors, they do not always overlook relatively weaker competitors. Instead, competitors with weaker but comparable market presence may be identified as potential challengers and be placed under surveillance. As such, after some modestly weaker competitors have entered a potentially attractive location, managers may worry that not responding will give these competitors an opportunity to catch up with—or even surpass—their company (Ferrier, Smith, & Grimm, 1999). In other words, as long as managers are aware of weaker competitors, they are motivated to secure their company's lead through monitoring and reacting upon these competitors' moves.

For the objective of keeping a leader ahead, clustering behavior represents an effective measure even when the real potential of a new location is highly uncertain.

Whether or not the target location turns out to be a promising destination, following weaker competitors there can help to sustain competitive status quo, which favors the focal firm. Hence, risk-averse managers may decide to follow its disadvantageous competitors into a new location regardless of their own assessments of that location's potential (Head et al., 2002; Knickerbocker, 1973). As Dixit and Nalebuff put it: 'if you have the lead, the surest way to stay ahead is to play monkey see, monkey do' (1991: 10). Thus, we expect that a firm is more likely to enter a new location when prior entrants there have possessed modestly weaker market presence relative to the focal firm. Formally:

> *Hypothesis 3: A moderate magnitude of competitive asymmetry in relation to weaker prior entrants in a new geographic location will increase a firm's likelihood of entering that location.*

Stronger prior entrants. The above discussion focused on managers' intent to secure their company's lead. Yet, this motivational factor is less relevant in characterizing a firm's interaction with more prominent competitors, in which case the primary concern for managers is to avoid lagging further behind competitors who have already possessed superior market presence. Competitors' superior market strength tends to raise managers' anxiety about the potential consequences of these competitors' moves (Chen et al., 2007). After a number of stronger competitors have entered a new location overseas, managers may fear that not responding will allow these competitors to become even more dominating, thereby placing their company is grave jeopardy.

When the relative advantage of prior entrants in a location is modest, firm managers may reason that their company has a fair chance of competing with these stronger opponents in the same location for local customers, production factors, and institutional support. As such, the firm may follow these modestly stronger competitors into the same location in an attempt to avoid lagging further behind. Two additional factors can escalate such a

behavioral tendency. First, competitors which superior market performance in the past are often viewed as better informed about what constitutes an effective course of actions (Haunschild & Miner, 1997). After these competitors have entered a certain location, managers may interpret the observed entry moves as revealing the very potential of that location, and thus feel compelled to follow suit (Bikhchandani, Hirshleifer, & Welch, 1998). Second, even if managers decide to follow more prominent competitors into a new location, but the destination turns out to be a bad one, such a faulty decision tends to carry less repercussion. As Scharfstein and Stein put it: 'an unprofitable decision is not as bad for reputation when others make the same mistake' (1990: 466). On the contrary, choosing not to follow prominent competitors into a location that turns out to be promising can be deemed as a personal mistake, for which decision makers will be held responsible. Accordingly, we expect that a firm is more likely to enter a new location when prior entrants there have possessed modestly stronger market presence relative to the focal firm. Formally:

> *Hypothesis 4: A moderate magnitude of competitive asymmetry in relation to stronger prior entrants in a new geographic location will increase a firm's likelihood of entering that location.*

Figure 1 presents a theoretical model that summarizes out four hypotheses. The model indicates that an increasing magnitude of competitive asymmetry in relation to weaker prior entrants will first increase a firm's likelihood of entering the given location due to managers' rising desire to sustain their company's lead (H3); however, when this magnitude increases even further, the firm's entry likelihood will reduce as managers overlook entry moves made by far weaker competitors (H1). On the other hand, an increasing magnitude of competitive asymmetry in relation to stronger prior entrants will first increase a firm's likelihood of entering the given location due to managers' rising anxiety about lagging further behind advantageous competitors (H4); however, as this magnitude increases even

further, the firm's entry likelihood will reduce as the firm is incapable of competing with far superior competitors in the same location for local customers, production factors, and institutional support (H2). Altogether, this line of reasoning suggests that a firm is most likely to enter a new location when its competitive relationships with prior entrants there are characterized by a moderate magnitude of asymmetry.

Insert Figure 1 about here

METHODS

Research Setting

The empirical setting of this research was computer and ancillary hardware companies in Taiwan and their entries into different geographic locations in Mainland China during the period from 2000 to 2005. By 1998, Taiwan's computer industry registered an annual production value of US$34 billion, making Taiwan the third-largest hardware supplier in the world (after the United States and Japan). Taiwan's PC industry consisted of many medium-sized producers, and most companies were contract manufacturers for leading global brands such as IBM, Dell, and HP (c.f. Dedrick & Kraemer, 1998). After the Asian Financial Crisis in 1997–98, a significant amount of economic wealth shifted from other East Asian countries to China. For Taiwanese PC companies, China not only represented an ideal site for setting up low-cost production facilities, but also became an important market in itself. Economic wealth increased rapidly in various locations, and local demand for PCs surged. Consequently, although relatively few Taiwanese companies had a significant presence in China in the mid-1990s, by 2005, investments by Taiwanese PC companies in China accounted for nearly seventy percent of their total overseas investments.

Data

The data used in this study covered all listed Taiwanese companies who had ever produced PCs or ancillary hardware using in-house manufacturing facilities during the period of observation. Companies were identified from two local sources: the Taiwan Stock Exchange (where larger and more established companies were listed) and the GreTai Securities Market (for smaller, more entrepreneurial companies). Regulations in Taiwan required listed companies to disclose in annual reports their sales of products accounting for ten percent or more of their total revenues. Using Standard Industry Classification (SIC) categories to define product market segments in the PC industry, this study sampled focal firms as all companies operating in the following five segments: computers, monitors and terminals, computer peripherals, audio and video equipment, and communication equipment. This procedure yielded 205 focal firms.

The explanatory variables of this study concerned prior entries made by all competitors competing with each focal firm. Because many of the sampled focal firms had diversified into other PC-related segments (e.g., optoelectronics components), they competed not only with one another, but also with companies in another 15 product segments (listed in Appendix 1). Hence, data on 344 more companies operating in these PC-related segments were also collected. These additional data were used in combination with the data on 205 focal firms for constructing variables.

For all these companies indentified through the snow-bowling approach, the present research traced their entries into various geographic locations in Mainland China using two complementary sources. First, the Investment Commission (the regulatory agency of overseas investment in Taiwan) reviewed and kept records of every investment project exceeding US$20,000. Taiwan's listed companies also reported their activities in China to the Market Observation Post System, an information platform managed by the Taiwan Stock

Exchange. Together, these two sources provided comprehensive coverage of Taiwanese companies' investments in China. These data were updated quarterly. Using these data, a *geographic location* was delineated as a province, municipality, or autonomous location in China, and an *entry* was identified as a company establishing its first subsidiary in a given location through equity investment (green-field investment, joint venture, or acquisition).

Analytical Approach and Dependent Variable

The hypotheses examined in the present research predicted a firm's likelihood of entering a new geographic location. Employing event history analysis (Kiefer, 1988), this dependent variable was operationalized as *entry rate*: the instantaneous probability that a firm will enter a location in which it did not have a subsidiary before. Each entry move made by a focal firm with respect to a given location was specified as an 'event.' The temporal horizon was modeled as the time elapsed since at least one of a focal firm's competitors (i.e., other companies operating in the same segments listed in Appendix 1) have entered a given location, in that a firm became 'at risk' of following its competitors into that same location since then.[2] This 'spell,' measured by quarters, ended in an event if a firm entered a given location during the period of observation; otherwise, a spell was right-censored, either because the firm was dissolved or because it had not entered a location by the end of 2005. Of the 205 sampled focal firms, 141 made a total of 240 entries into 17 different locations in China. The data were organized as firm-location level observations, and a focal firm's rate of entering a given location was estimated using Cox models (Cox, 1975):

$$h(u) = h_0(u) \cdot \exp(X'\beta)$$

In the above equation, $h(u)$ denotes entry rate, given a spell of duration u. Therefore, $h(u)$ is the product of the baseline rate $h_0(u)$ and an exponential linear function of time-

[2] To avoid left-censoring, all companies' operations in China were traced all the way back to 1991 to determine whether a 'spell' should begin before the first quarter of 2000. Yet except for correcting for spell duration, the statistical analyses covered only the period from 2000 to 2005, because many other data before the period were quite incomplete.

varying covariates (denoted by X). The results reported in this paper were based on semi-parametric models, in which the baseline rate was left unspecified except for being non-negative, and the effects of covariates were estimated through maximum partial likelihood. For a robustness check, this study also specified Weibull distribution and estimated full likelihood models (including both proportional hazards and accelerated failure time models). These alternative models yielded fully consistent results.

Explanatory Variables

Different magnitudes of competitive asymmetry, the explanatory variables, were identified through juxtaposing industry members' distinct market profiles. Following Chen (1996), this study first computed the presence of a given competitor (denoted by j) in the industry segments that it overlapped with a focal firm (denoted by i):

$$R_{ij} = \sum_m \left(\frac{S_{im}}{S_i} \times \frac{S_{jm}}{S_m} \right)$$

In the above equation, the importance of segment m (one listed in Appendix 1) to firm i was adjusted for using i's sales in this segment (S_{im}) in proportion to i's total sales (S_i). The presence of competitor j in segment m was measured as j's sales in this segment (S_{jm}) in proportion to the overall size of the segment (S_m). As R_{ij} did not account for a focal firm's own market strength, this study next computed a focal firm's presence in the shared segments:

$$F_{ij} = \sum_m \left(\frac{S_{im}}{S_i} \times \frac{S_{im}}{S_m} \right)$$

Similarly, the importance of segment m to firm i was adjusted for using i's sales in this segment (S_{im}) in proportion to i's total sales (S_i). The presence of firm i in segment m was measured as its sales in this segment (S_{im}) in proportion to the overall size of the segment (S_m). Comparing R_{ij} and F_{ij} revealed whether a given competitor was generally stronger or weaker than a focal firm in their shared segments. For a relatively weaker competitor, the

magnitude of competitive asymmetry was measured as the size of the difference between F_{ij} and R_{ij}, normalized by F_{ij}:

$$magnitude\ of\ asymmetry_{ij} = \frac{F_{ij} - R_{ij}}{F_{ij}} \quad if\ F_{ij} > R_{ij}$$

On the other hand, for a relatively stronger competitor, the magnitude of competitive asymmetry was measured as the size of the difference between R_{ij} and F_{ij}, normalized by R_{ij}:

$$magnitude\ of\ asymmetry_{ij} = \frac{R_{ij} - F_{ij}}{R_{ij}} \quad if\ R_{ij} > F_{ij}$$

The value of these magnitude measures approached one when a competitor possessed far superior or far inferior market strength in relation to a focal firm, and approached zero when the two parties possessed nearly identical strength. The two hypotheses to be examined concerned a firm's relationships with those competitors who have entered a particular location. Hence, the two corresponding explanatory variables were computed as the average magnitude of competitive asymmetry in a firm's relationships with stronger and weaker prior entrants in a given location. These variables were time-varying covariates in Cox models, updated at the end of each quarter. Time notations were omitted in the above equations for the sake of simplicity.

Control Variables

A number of control variables were included in Cox models as covariates. First, this study controlled for each focal firm's (absolute) market power and operating performance back in Taiwan, which could influence overseas operations (Caves, 1996; Hymer, 1976). Market power was measured as the average of a firm's shares (by revenues) in all the product segments (listed in Appendix 1) in which it operated. Operating performance was measured as return on assets. Because data on firms' sales and returns were made available annually, these two covariates were updated at the end of each year in Cox models.

Second, this study controlled for each focal firm's experience and existing operations in Mainland China, which could facilitate further expansion (Chang, 1995; Johanson & Vahlne, 1977). Experience in China captured how many quarters had passed since a firm established its first subsidiary in China. On the other hand, existing operations in China was measured in terms of their scope: the number of geographic locations in which a firm operated. These covariates were updated at the end of each quarter in Cox models.

Third, due to substantial location differences in China, this study controlled for the local conditions in each geographic location. Number of prior entrants captured the sheer number of a firm's competitors having entering a given location, which by itself could drive density-dependent mimetic entry (Haveman, 1993). In addition, this study obtained from the *China Statistical Yearbooks* an array of macroeconomic indicators for each location. As Appendix 2 shows, these indicators loaded on four distinct factors: internationalization, wealth of population, supply of skilled labor, and transportation infrastructure. These covariates were updated at the end of each year in Cox models.

Finally, this study accounted for unobserved temporal heterogeneity by including year dummies. In addition, since the data were organized at the firm-location level, each focal firm was associated with multiple observations corresponding to its rate of entering different locations. Observations of the same firm were likely to be correlated to one another. Hence, robust variance estimates were implemented to adjust for within-cluster nonindependence (c.f. Wooldridge, 2001).

RESULTS

Table 1 displays summary statistics of all the variables used in this study. Table 2 reports the results of Cox models. Model 1 only includes control variables. Main explanatory variables and their squared terms are entered into Models 2–5 successively. Model 6 shows the estimates of all variables.

Insert Table 1 and Table 2 about here

Together, Hypotheses 1 and 3 predict that an increase in the magnitude of competitive asymmetry in relation to weaker prior entrants will first increase but then decrease a firm's entry rate. Models 3 and 6 examine this curvilinear prediction. In both models, the estimated effect of the main variable is positive and significant, whereas the estimated effect of the squared term is negative and significant. Further calculations (based on Model 6) indicate that the magnitude of asymmetry in relation to weaker prior entrants has the maximal positive influence on entry rate at the value of 0.64. Before this turning point, an increase in the magnitude of asymmetry is associated with an increase in entry rate; yet beyond this turning point, a further increase in the magnitude of asymmetry is associated with a decrease in entry rate. This finding corroborates Hypotheses 1 and 3.

On the other hand, Hypotheses 2 and 4 predict that an increase in the magnitude of competitive asymmetry in relation to stronger prior entrants will first increase but then decrease a firm's entry rate. Models 5 and 6 examine this curvilinear prediction. In both models, the estimated effect of the main variable is positive and significant, whereas the estimated effect of the squared term is negative and significant. Further calculations (based on Model 6) indicate that the magnitude of asymmetry in relation to stronger prior entrants has the maximal positive influence on entry rate at the value of 0.55. Before this turning point, an increase in the magnitude of asymmetry is associated with an increase in entry rate; yet beyond this turning point, a further increase in the magnitude of asymmetry is associated with a decrease in entry rate. This finding corroborates Hypotheses 2 and 4.

Figure 2 presents, graphically, the effects of the different magnitudes of competitive asymmetry on entry rate. As the figure shows, a firm is most likely to enter a new geographic

location when its relationships with prior entrants there are characterized by a moderate magnitude of competitive asymmetry. This is so for both stronger and weaker prior entrants.

Insert Figure 2 about here

Robustness Check

In addition to event history analysis, this study also implemented conditional logit models (McFadden, 1973). The alternative analytical approach estimated a firm's likelihood of 'choosing' one particular location among all locations that the firm could potentially enter, under the condition that this firm will enter at least one location at a given point in time. As such, the samples were restricted to firms that entered at least one location in a given quarter. Consistent results were obtained, suggesting that the results reported in this paper are robust against an alternative analytical approach and restricted samples.

DISCUSSION

This study contributes to the literature in three areas. The first is to refine the concept of competitive asymmetry and unveil its implications for firm behavior. Scholars have long acknowledged the importance of this concept (Amit & Schoemaker, 1993; Carpenter et al., 1988) and demonstrated its empirical existence in a variety of contexts (Chen, 1996; DeSarbo et al., 2006). However, theoretical refinements have been lacking, and the behavioral implications of this concept have not been examined. The present research tackles these issues head-on, showing how the different magnitudes of competitive asymmetry affect a firm's decision to enter its industry competitors' overseas territories.

Second, this study injects firm-centric, relationship-specific considerations into international business research on firms' clustering behavior. Inspired by Knickerbocker's seminal work (1973), a significant volume of studies have identified the aggregate, structural conditions of an industry as key determinants of industry members' propensity of following

one another into the same geographic location (e.g., Anand & Kogut, 1997; Delios et al., 2008; Flowers, 1976; Gimeno et al., 2005; Yu & Ito, 1988). However, these studies have paid only scant attention to the idiosyncratic relationships between industry competitors (Rose & Ito, 2008). In contrast, the concept of competitive asymmetry reflects a focal firm's individualistic viewpoint on each of its industry competitors. Through utilizing this concept, the present research accounts for the typical situation that a firm often experiences varying degrees of competitive tension from different industry members and has a differential propensity of responding to their moves. These efforts provide a fine-grained, differentiated description of intra-industry heterogeneity of competition.

Third, this study extends the oligopolistic reaction theory (Head et al., 2002; Knickerbocker, 1973). Such a theoretical extension hints at how the different magnitudes of competitive asymmetry affect a firm's awareness of prior entrants in a new geographic location, its motivation to follow them into that location, and its capability to effectively compete with them there. Accordingly, the present research argues and shows empirically that a firm is most likely to enter a new geographic location when its relationships with prior entrants there are characterized by a moderate magnitude of competitive asymmetry. This finding sheds light on the long-standing issue of 'who follows whom' as industry competitors expand overseas.

Further Implications

Clustering behavior reveals a firm's propensity of engaging its competitors in the same overseas territories. In the strategy and economics literature, scholars have long been interested in whether stronger or weaker members of an industry are more inclined to engage the other party (for a review, see Más-Ruiz, Nicolau-Gonzálbez, & Ruiz-Moreno, 2005). While some studies suggest that stronger members are more inclined to engage their weaker opponents than vice versa, other studies suggest the opposite. Different drivers for firm

behavior have been proposed in support of the opposing views, but consolidation remains lacking. These fragmented theoretical arguments can be better integrated through considering the size of the difference in industry members' market strength: while a certain behavioral driver may dominate when this difference is relatively small, another driver may become the main determinant when this difference is relatively large. Indeed, the present results summarized in Figure 2 indicate that whether a competitor is stronger or weaker than a focal firm may matter less than the size of their difference in market strength.

Similarly, research on domestic rivalry has indentified an array of awareness, motivation, and capability factors (Smith, Ferrier, & Ndofor, 2001). Nonetheless, little is known about the relative importance of these factors in driving firm behavior (Chen et al., 2007). Although this study does not directly observe these factors, the empirical results reveal the existence of certain turning points, around which the behavioral consequences of an increasing magnitude of competitive asymmetry will reverse. These turning points exist perhaps because the dominant behavioral mechanism can shift from one to another (c.f. Meyer, 2009). Hence, a specific factor may have a decisive impact on firm behavior in relation to a given competitor, depending upon the nature of the relationship between the two parties.

The present study also informs organizational research on imitation behavior (c.f. Lieberman & Asaba, 2006). An important issue to organization theorists concerns whom a firm imitates in adopting a certain behavioral strategy (such as entering a new market). Some studies suggest that industry members occupying similar competitive positions are more inclined to imitate one another (e.g., Greve, 1998), some studies find that a firm is more inclined to model other organizations with superior market presence (e.g., Haunschild & Miner, 1997), and still some studies show that a firm is more inclined to follow relatively weaker competitors (e.g., Terlaak & King, 2007). These seemingly contradicting findings

can be consolidated through considering the different magnitudes of competitive asymmetry. The results of this study are in line with the prediction that a firm is more inclined to follow 'similar' others—or other organizations who are neither far superior nor far inferior in their market strength relative to the focal firm; yet, among these organizations with comparable market strength, those who are modestly 'stronger' or modestly 'weaker' are more likely to be followed. As suggested earlier, this pattern emerges perhaps because different behavioral mechanisms dominate a firm's interactions with different industry members.

Limitations and Future Research

This study identifies competitive asymmetry by juxtaposing industry members' presence in multiple market segments in their industry. The reason behind such a market-focused analysis (Abell, 1980; Day, 1981) is that competitors' market profiles can be more easily observed and evaluated by firm managers, and hence are more likely to have direct behavioral implications. Nonetheless, scholars have also highlighted the importance of resource endowments in studying competition (Chen, 1996; Markman, Gianiodis, & Buchholtz, 2009; Peteraf & Bergen, 2003). In particular, resource endowments are expected to affect a firm's capability to engage its competitors. A closer look at resource endowments will further enrich the concept of competitive asymmetry.

This article extends the oligopolistic reaction theory through considering a firm's awareness, motivation, and capability in relation to different prior entrants in a new location. Nonetheless, the present research does not directly observe these suggested factors—which is a common challenge encountered in most existing studies of interfirm rivalry (Smith et al., 2001). As a result, the empirical works implemented here represent a reduced-form test, and the interpretations of the findings are speculative. Future research may seek to capture the proposed factors directly, perhaps through surveying firm managers and industry experts.

In this study, a geographic location is delineated as a province, municipality, or autonomous location in China. In contrast, prior studies on clustering behavior often treated a host country as one geographic market, thereby ignoring the possibility that a firm may follow its competitors into the same host country but choose a different location there. Entering a different location in the same host country may represent a firm's attempt to differentiate itself from—rather than to follow or match—its industry competitors. While the treatment here is more refined, the present research does not account for the possibility that a firm may follow its competitors into the same location but establish a differentiated operation there. Clustering behavior, as a form of imitation (Lieberman & Asaba, 2006), is not simply a dichotomous construct and can occur in varying degrees. These complexities warrant future research.

Although the data used in this study cover firms operating in multiple industry segments and their entries into various geographic locations, these segments are highly related, and all the locations are within Mainland China. As a result, the findings may reflect some industry- and country-specific factors. Specifically, the research context is highly dynamic: life-cycles of PC-related products are very short, and China, as the most important destination for overseas expansion, is evolving at an amazing pace. Consequently, most companies are highly anxious about lagging behind their industry competitors. Within this somewhat supercharged context, a firm's propensity of acting upon its competitors' entry moves may be higher in comparison to other cases. Future research in other settings will help to address the concern of generalizability.

In conclusion, the present research refines the concept of competitive asymmetry and utilizes this concept to inject firm-centric, relationship-specific considerations into international business research on firms' clustering behavior. Accordingly, this study adds to

scholars' understanding of cross-border competition, shedding light on 'who follows whom' in the course of overseas expansion.

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TABLE 1
Means, Standard Deviations, and Correlations

			Correlations									
Variables	**Mean**	**S.D.**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Magnitude of asymmetry in relation to weaker prior entrants	0.35	0.35										
2. Magnitude of asymmetry in relation to stronger prior entrants	0.54	0.36	-.52									
3. Firm: home market share (%)	2.78	4.83	-.40	.39								
4. Firm: return on asset (%)	6.10	11.33	-.06	.06	.11							
5. Firm: experience in China operations	8.87	8.93	-.15	.15	.23	-.14						
6. Firm: scope of China operations	1.28	1.31	-.21	.19	.28	-.04	.71					
7. Region: number of prior entrants	5.07	9.92	.13	.12	-.08	.00	-.05	-.07				
8. Region: internationalization	0.23	1.02	.18	.14	.00	.00	-.18	-.18	.46			
9. Region: wealth of population	0.37	1.00	.18	.08	.00	-.08	.27	.16	.17	.08		
10. Region: supply of skilled labor	0.22	1.10	-.10	.09	-.01	-.07	.28	.18	.12	-.06	-.08	
11. Region: transportation infrastructure	0.19	1.23	.14	.04	-.02	.00	-.04	-.05	-.01	-.05	.10	-.19

TABLE 2
Cox Models of Entry Rate

	Models					
Variables	**1**	**2**	**3**	**4**	**5**	**6**
Magnitude of asymmetry in relation to weaker prior entrants		0.76 *	2.17 *			2.11 *
		(0.30)	(0.89)			(0.88)
(Magnitude of asymmetry in relation to weaker prior entrants)^2			-1.63 †			-1.66 †
			(0.85)			(0.86)
Magnitude of asymmetry in relation to stronger prior entrants				-0.02	2.53 **	2.34 **
				(0.35)	(0.79)	(0.78)
(Magnitude of asymmetry in relation to stronger prior entrants)^2					-2.68 **	-2.13 *
					(0.84)	(0.83)
Firm: home market share (%)	0.04 *	0.02	0.03 †	0.04 *	0.04 *	0.04 *
	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Firm: return on asset (%)	0.00	0.00	0.00	0.00	0.00	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Firm: experience in China operations	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Firm: scope of China operations	0.21	0.19	0.20	0.21	0.22	0.21
	(0.16)	(0.17)	(0.17)	(0.17)	(0.18)	(0.17)
Region: number of prior entrants	0.02 **	0.02 **	0.01 **	0.02 **	0.01 **	0.01 **
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Region: internationalization	0.97 **	0.97 **	0.93 **	0.97 **	0.91 **	0.85 **
	(0.10)	(0.11)	(0.11)	(0.11)	(0.11)	(0.12)
Region: wealth of population	0.49 **	0.43 **	0.41 **	0.49 **	0.46 **	0.38 **
	(0.11)	(0.10)	(0.10)	(0.11)	(0.10)	(0.11)
Region: supply of skilled labor	0.36 **	0.31 **	0.30 **	0.36 **	0.34 **	0.28 *
	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.12)
Region: transportation infrastructure	0.23 **	0.23 **	0.22 **	0.24 **	0.21 **	0.19 **
	(0.05)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Year dummies	included	included	included	included	included	included
Log (pseudo)likelihood	-1600.60	-1595.67	-1593.94	-1600.60	-1596.35	-1590.71
Wald chi-sq against null model	427.99 **	448.40 **	492.79 **	450.84 **	450.41 **	561.37 **
Akaike information criterion	3229.20	3221.34	3219.88	3231.20	3224.69	3217.43

†$p<.1$; *$p<.05$; **$p<.01$; all two-tailed tests. Robust standard errors (clustered by firms) are in parentheses.

FIGURE 1
A Theoretical Model of Competitive Asymmetry

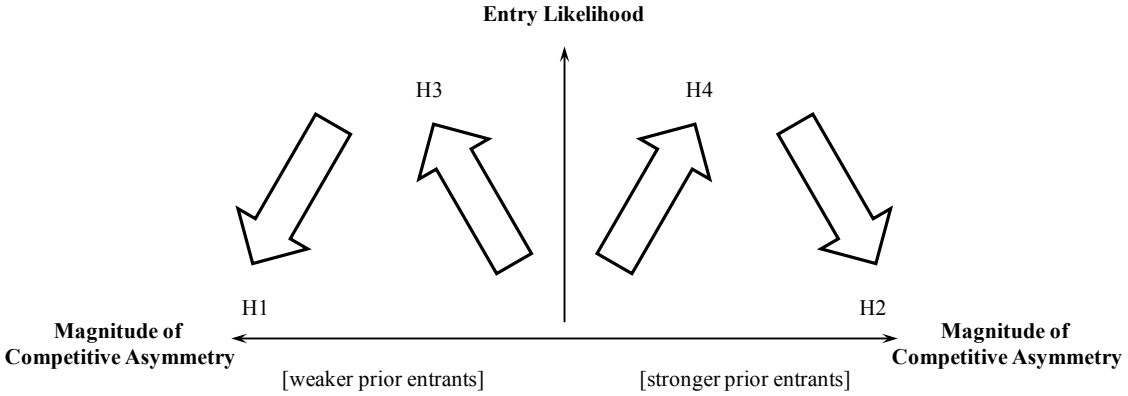
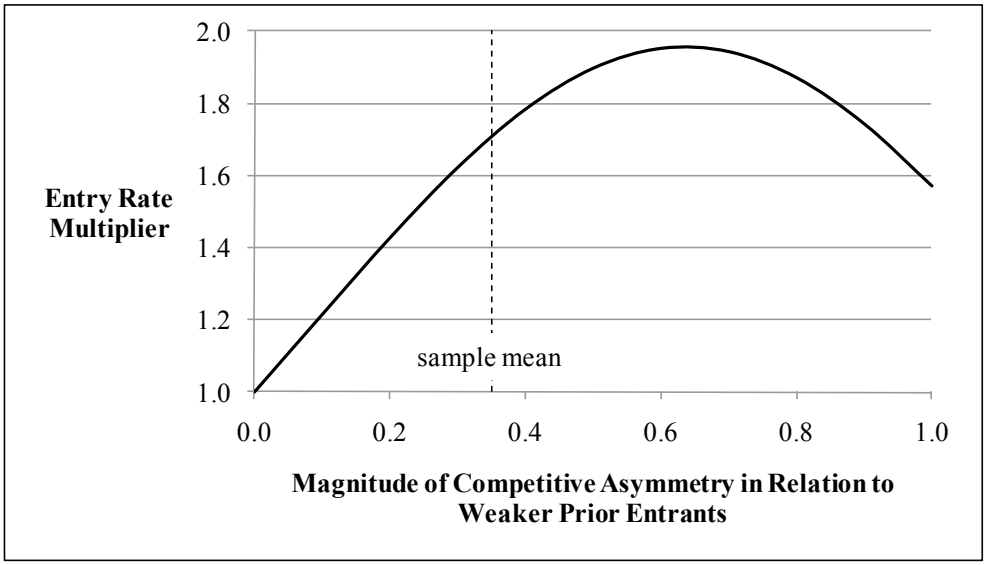
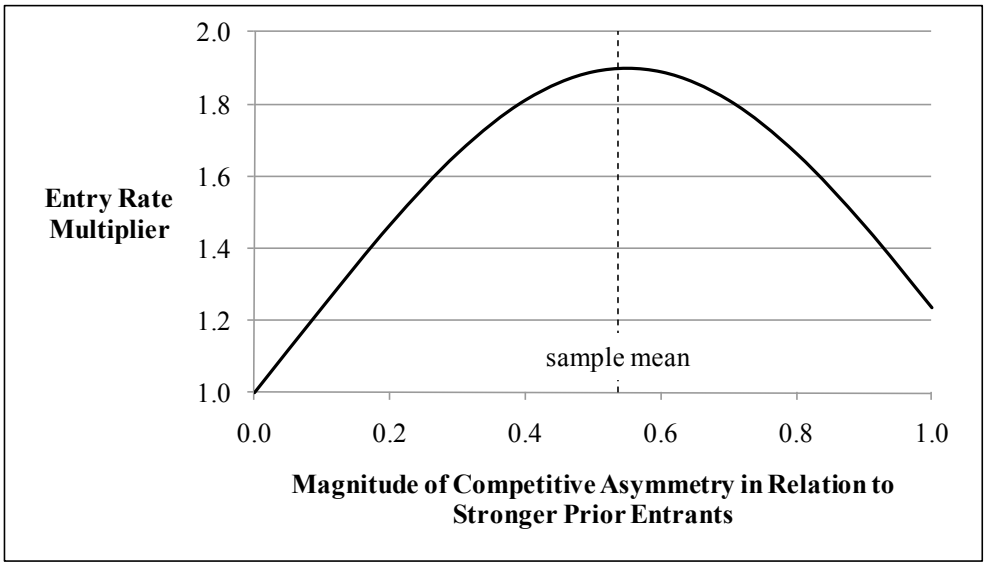


FIGURE 2
Effect of Different Magnitudes of Competitive Asymmetry

(a)



(b)



APPENDIX 1
Product Market Segments in the IT industry

1. Computers	11. Electro-medical equipment
2. Monitors and terminals	12. Integrated circuits
3. Computer peripherals	13. Discrete devices
4. Audio and video equipment	14. Semiconductors packaging and testing
5. Communication equipment	15. Electronic passive devices
6. Telephones and cellular phones	16. Bare printed circuit boards
7. Storage media	17. Printed circuit boards assembly
8. Cameras	18. Electronic parts and components
9. Optical instruments	19. Liquid crystal panel
10. Measuring and control equipment	20. Optoelectronic materials and components

Focal firms in the sample stem from segments 1-5.

APPENDIX 2
Local Conditions of Different Geographic Locations in China

Item	International-ization	Wealth of Population	Supply of Skilled Labor	Transportation Infrastructure
1. Total foreign capital	**.90**	.25	.25	.16
2. Exports	**.87**	.33	.29	.15
3. Imports	**.83**	.36	.27	.29
4. Gross domestic product per capita	.49	**.63**	.19	.55
5. Disposable income per capita	.45	**.81**	.21	.27
6. Household expenditure per capita	.44	**.81**	.18	.27
7. No. of professional personnel	.40	-.43	**.75**	-.07
8. Population with a college degree	.28	.20	**.91**	.08
9. No. of recent college graduates	.12	.31	**.90**	.02
10. Highway density	.44	.49	.06	**.66**
11. Railway density	.12	.18	-.01	**.96**
Cumulative variance explained	.30	.54	.77	.94

Rotation: orthogonal varimax