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IF THEY CAN DO IT, WHY NOT US? COMPETITORS AS REFERENCE POINTS FOR JUSTIFYING ESCALATION OF COMMITMENT

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This study highlights competitive market conditions as an important structural determinant of escalation of commitment. Bridging escalation behavior literature and competitive dynamics research, we argue that reference to certain rivals may enable or disable decision makers to justify continuing investment in an underperforming initiative, thereby influencing a firm's tendency toward escalating commitment. We test our ideas using data on a set of leading companies in the information technology industry and their investment activities in China. Empirical analysis reveals strong evidence that a firm's escalating tendency is increased by larger competitors' high action volume and smaller competitors' positive performance. In contrast to prior research focus on decision makers' persistence irrespective of external cues, we also find that a firm's escalation behavior is decreased by larger rivals' negative performance.

When firms enter an unfamiliar territory such as a new overseas location, investing sequentially allows them to adjust their investment plans for each subsequent round in accordance to prior performance (Dixit & Pindyck, 1994). If a firm has performed poorly in a target location, it might be expected to become more cautious about subsequent investment; yet decision makers often are inclined to make—rather than withhold—further investment in an underperforming initiative, resulting in escalation of commitment (Staw, 1976, 1997). Prior studies have relied heavily on laboratory experiments to unveil pro-commitment biases of individual subjects (for a review, see Sleesman, Conlon, McNamara, & Miles, 2012), but there has been scant research examining the structural determinants of firms' escalation behavior (Guler, 2007, and McNamara, Moon, & Bromiley, 2002, are among the exceptions). In this paper, we highlight competitive market conditions as an important structural determinant. Despite the presence of pro-commitment biases, it is unlikely that firms facing adverse performance situations will just blindly insist upon the current course without any justifications, and certain reference points in the market environment may enable or disable decision makers to justify further commitment on a reasonable ground (Adner & Levinthal, 2004; Zardkoohi, 2004). Very little, however, is known about how such external reference points will affect firms' commitment to an underperforming initiative.

In this research, we focus on one's competitors as key reference points (Fiegenbaum, Hart, & Schendel, 1996; Kim & Tsai, 2012) and potential sources of justifications for escalating commitment. Prior research has shown that firms' initial decisions to pursue an initiative—such as entering a new loca-

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tion (Gimeno, Hoskisson, Beal, & Wan, 2005), adopting a new technology (Rogers, 2003), or implementing a set of new organizational practices (Guler, Guillén, & MacPherson, 2002)—are subject to competitors' behavioral influence. Extending this line of work, we theorize that competitors also affect a firm's subsequent commitment to an underperforming initiative, through revealing cues on the likely prospect of persistency (Bikhchandani, Hirshleifer, & Welch, 1998; Lieberman & Asaba, 2006). Further, extending competitive dynamics research (Chen & Miller, 2012; Ketchen, Snow, & Hoover, 2004; Smith, Ferrier, & Ndofor, 2001), we argue that one's larger and smaller competitors exert differential influence on escalation behavior. Larger, more resourceful competitors have usually been regarded as main reference points, as they are better informed (Haunschild & Miner, 1997) and impose greater competitive tension (Chen, Su, & Tsai, 2007). Adding to the traditional emphasis on larger rivals, we highlight that smaller competitors are also influential, since reference to less-endowed others can reveal more clearly the capability threshold at which pursuing an initiative becomes beneficial (Terlaak & King, 2007).

Despite recent progress in understanding the behavioral interdependence among market rivals (e.g., Hsieh & Vermeulen, 2014; Livengood & Reger, 2010; Marcel, Barr, & Duhaime, 2011; Tsai, Su, & Chen, 2011; Zhang & Gimeno, 2010), competitors' influence on escalating resource commitment remains largely unclear (Ferrier, MacFhionnlaoich, Smith, & Grimm, 2002). This study contributes to building a conceptual bridge between escalation behavior literature and competitive dynamics research, through highlighting competitive market conditions as an important structural determinant of escalation of commitment (Sleesman et al., 2012). Our analysis illustrates—perhaps for the first time in the literature—how reference to competitors with varying relative sizes can provide justifications for further commitment to an underperforming initiative. In doing so, we extend prior conceptualizations of competitive relativity and asymmetry (Chen, 1996; Chen & Miller, 2012) and open up a new avenue of future inquiry into competitive dynamics under adverse performance situations.

We tested our ideas using data on a set of leading companies in the information technology (IT) industry and their investment activities in China during the period of 1998 to 2011. We identified the occasions in which a focal firm has been operating at a loss ever since entering a certain location in China, and examined its tendency of making subsequent resource commitment to such a loss-incurring place. Since the literature has been limited in addressing competitors' influence on escalation behavior, we also conducted three waves of field interviews to inform our theory development. (Background information of our interviewees is shown in Appendix A1.) It is important to note that our study is deductive in nature. Hence, these interviews were not designed for grounded theory building, but, instead, for aligning our abstract logical reasoning with concrete phenomena and for illustrating our arguments using real examples (Creswell, 2008). With the interviews supplementing our archival data, we analyze the role of competitive market conditions in shaping firms' escalation behavior.

THEORETICAL BACKGROUND

The defining features of escalating commitment scenarios are threefold, encompassing negative performance feedback on prior investment, subsequent commitment decisions, and uncertainty surrounding the chance of future success (Brockner, 1992; Staw, 1997). These features distinguish escalation of commitment from other, related phenomena that concern general consistency in decision making without negative feedback and uncertainty about goal attainment—such as momentum (Amburgey & Miner, 1992), inertia (Briscoe & Tsai, 2011; Kumar, 2004), and preference for the status quo (Hambrick, Geletkanycz, & Fredrickson, 1993). Our study examines firms' escalation behavior in the context of overseas expansion. Entering a new overseas location requires not only significant initial investment upon entry but also ongoing resource support (Johanson & Vahlne, 2009). These investments usually cannot generate immediate return, and the eventual payoff will typically remain uncertain for a prolonged period of time (Zaheer & Mosakowski, 1997). Firms display escalation behavior when they have performed poorly in a target location but still are inclined to make—rather than withhold—further resource commitment.

Competitive Dynamics and Escalation of Commitment

The literature on escalation of commitment has focused on unveiling decision makers' personal biases, such as their desire to justify past behavior

when results fall short of expectations (Staw, 1976), reluctance to use updated information to revise personal beliefs (Nisbett, Borgida, Crandall, & Reed, 1982), and failure to treat initial irreversible investment as sunk cost (Arkes & Blumer, 1985). Thus far, little attention has been paid to the structural determinants of escalation behavior (Sleesman et al., 2012). Since business organizations are subject to competitive selection pressure and monitored by governance mechanisms, the conduct of decision makers who continue to invest in an underperforming initiative will be increasingly scrutinized and questioned by other stakeholders, and hence mobilizing further resource support will become increasingly difficult (Guler, 2007; McNamara et al., 2002; Zardkoohi, 2004). For decision makers to insist upon such a course, they need to provide a convincing rationale that their persistency in the face of adversity will eventually pay off (Adner & Levinthal, 2004).

To justify additional resource commitment to a loss-incurring location, decision makers can refer to competitors who have also invested in the same place. Firms often use competitors as external reference points for decision making (Fiegenbaum et al., 1996; Kim & Tsai, 2012), and thus competing companies tend to benchmark against one another when investing overseas (Chan, Makino, & Isobe, 2006; Gimeno et al., 2005; Rose & Ito, 2008). The behavioral interdependence among market rivals has been a central interest of competitive dynamics research (Chen & Miller, 2012; Ketchen et al., 2004; Smith et al., 2001), which portrays competition as a race-like contest in which all parties must stay active or risk losing ground (Chen, Lin, & Michel, 2010; Derfus, Maggitti, Grimm, & Smith, 2008; Young, Smith, & Grimm, 1996). Competitors that actively pursue an initiative (e.g., expanding overseas) may gain unique benefits (e.g., access to local buyers and production factors) that empower them to challenge inactive firms (Boyd & Bresser, 2008; Ferrier, Smith, & Grimm, 1999). Hence, competitors' presence in a certain domain will make decision makers anxious about the danger of being outcompeted and drive a focal firm to increase its commitment to the same place (Chen et al., 2007; Livengood & Reger, 2010; Yu & Cannella, 2007).

Although competitive dynamics research has yet to examine firms' resource commitment specifically under adverse performance situations, we expect firms' escalation behavior to be influenced by their rivals. For example, competitors' active involvement in a given location can be interpreted as signaling the presence of important opportunities there (Bikhchandani et al., 1998). Additionally, if competitors have performed well in a certain location, decision makers can reason that their companies can similarly benefit from that same place if they stay persistent (Haunschild & Miner, 1997). These observations of one's competitors provide justifications for escalating commitment not only by creating a favorable expectation for return on further investment, but also by placing a firm under the pressure to keep up with its rivals in seizing business opportunities (D'Aveni, 1994; Knickerbocker, 1973; Lieberman & Asaba, 2006). A staff manager reporting directly to the CEO of her company shared with us her experience:

> After you have tried but failed, the doubt they [top management team] have on you inevitably grows, and gaining their support for your course becomes increasingly difficult. When people question your judgment—perhaps your motivation as well—referring to competitors can at least give you something objective and concrete to lean on.

Competitors with Varying Relative Sizes

As external reference points, competitors with varying relative sizes are expected to exert differential influence on commitment decisions. Relative size, or comparative scale of operations, is a basic organizational characteristic used frequently by managers to categorize competing organizations and make sense of their task environment (Clark & Montgomery, 1999; Porac, Thomas, Wilson, Paton, & Kanfer, 1995). Due to differences in resource endowment and competitive strength, larger and smaller rivals tend to differ in their conducts, causing a firm to display different behavioral orientations toward them (Chen & Hambrick, 1995; D'Aveni, 1994). Because organizational information processing is selective—such that organizational members "pay attention to some parts of their comparative environment and ignore other parts" (Cyert & March, 1963: 173)—firms' interactive behavior is affected by how they selectively process and interpret their observations of larger and smaller competitors (Kim & Tsai, 2012; Ocasio, 1997; Smith, Grimm, Gannon, & Chen, 1991).

Considering a firm's selective attention to other organizations, prior research has usually emphasized the behavioral influence of larger rivals, because more resourceful competitors are better informed (Haunschild & Miner, 1997) and impose a higher competitive tension (Chen et al., 2007). Fol-

lowing this conventional wisdom, we reason that the actions and negative performance of one's larger (rather than smaller) competitors will exert a stronger influence on resource commitment decisions, through signaling the presence of important opportunities or major obstacles in a target location. Further, going beyond the traditional emphasis on larger rivals, we theorize that the positive performance of one's smaller (rather than larger) competitors will attract greater attention from decision makers, who are prompted to think, "If smaller rivals can pull it off, then we should be able to make it, too." In other words, reference to the successful experience of less-endowed competitors reveals more clearly the capability threshold at which pursuing an initiative becomes beneficial (Terlaak & King, 2007). Our joint consideration of larger and smaller rivals helps to reveal the distinct informational values of these different reference points for decision making.

HYPOTHESES

To evaluate escalation of commitment, we follow the action-centered approach in competitive dynamics research (Chen & Miller, 2012; Smith et al., 2001) and examine a firm's tendency to keep undertaking new strategic actions in an overseas location in which it has performed poorly (i.e., as the dependent variable). In competitive dynamics research, "actions" refer to the observable, externally oriented activities carried out by firms to enhance their competitive stand. Prior research has distinguished between tactical actions (e.g., change in price, a new advertising campaign) and strategic actions (e.g., expansion of product lines, a new research center). In contrast to tactical actions, strategic actions occur less frequently, require more resource support to carry out, and are more consequential in the long run (Chen, Smith, & Grimm, 1992; Miller & Chen, 1994). Hence, we focus on strategic actions as indicators of continuing resource commitment.

Larger Competitors' Action Volume

To justify further commitment to a loss-incurring location, decision makers can look for external cues indicating that the target location offers important opportunities and that their own company is under time pressure to seize these opportunities. Reference to larger competitors' strategic actions in that location may provide such supportive cues. Competitive dynamics research has examined various characteristics of action repertoire (Chen et al., 2010; Ferrier, 2001; Rindova, Ferrier, & Wiltbank, 2010; Young et al., 1996; Yu, Subramaniam, & Cannella, 2009). These characteristics include, for example, action volume (versus inactivity), simplicity (versus complexity), and heterogeneity (versus conformity). In this study, we place our main analytical focus on rivals' action volume—a basic and frequently examined characteristic defined as the total number of actions taken by a certain rival over a given time period. In contrast to other, more complicated repertoire characteristics, competitors' action volume can be observed and interpreted most easily by managers, and thus is expected to have direct, straightforward implications for interactive firm behavior.

Larger rivals are better endowed, enabling them to devote more resources toward search and market intelligence (Baum, Li, & Usher, 2000; Haunschild & Miner, 1997; Rogers, 2003). Because they have superior private information, their active involvement in a location can be viewed as signaling the presence of important opportunities there (Bikhchandani et al., 1998). Further, since larger competitors are more capable of carrying out preemptive tactics that put slow movers at a disadvantage (Scherer & Ross, 1990), their high action volume in a location creates an additional pressure for firms to avoid lagging behind in the pursuit of business opportunities (Chen et al., 2007; Chen & Hambrick, 1995; Lieberman & Montgomery, 1998). A middle manager in the finance department provided an anecdotal illustration:

> He [a director responsible for Shanghai operations] demanded more resource support for, well, expanding his territory, talking like his plan is of the upmost importance and should be supported at all costs. Our team criticized his predictions of growth and return for being too optimistic. He slapped forcefully on a slide showing what other companies have been doing and raised his voice, "They [competitors with leading shares] are so active [undertake many strategic actions] because they know better. Slow down, and we would surrender opportunities to them!"

Accordingly, we expect that escalating commitment is especially likely to occur when one's larger competitors have engaged in a high volume of strategic actions in a location under consideration. When decision makers can refer to their larger rivals' active involvement as a supportive signal of business opportunities, their companies are more

likely to make further resource commitment—in the form of undertaking new strategic actions—despite their own lack of success. In such a situation, decision makers are better able to reason that the importance of seizing opportunities should outweigh the incremental resource cost of making additional moves to overcome obstacles (Adner & Levinthal, 2004). Conversely, when larger competitors have been inactive in the target location, revealing that they may not consider the target location attractive, firms are less likely to make subsequent commitment because doing so is less expected to yield future returns. In this scenario, decision makers will find it more difficult to justify and mobilize further resource support for additional investment—even if they personally prefer to stay persistent (Guler, 2007; Zardkoohi, 2004).

On the other hand, smaller competitors' high action volume, although reflecting their positive assessment of a location, represents a noisy signal of location attractiveness since smaller organizations' actions tend to be less informative and relatively unstable (Baum et al., 2000; Haunschild & Miner, 1997; Rogers, 2003). In addition, because smaller competitors are less capable of blocking late movers (Scherer & Ross, 1990), their pursuit of business potentials generates a lower level of competitive tension (Chen et al., 2007; Chen & Hambrick, 1995; Lieberman & Montgomery, 1998). Accordingly, when decision makers look externally for supportive indicators of the importance of a loss-incurring location, reference to smaller competitors' action volume would have limited informational value. Although this line of reasoning does not entirely reject the possibility that smaller rivals' actions might still affect escalation behavior, such an influence is expected to be weaker in comparison with the case of larger rivals. We therefore highlight the influence of larger competitors' action volume on firms' escalation behavior, and propose:

Hypothesis 1. Firms are more inclined to undertake new strategic actions in a loss-incurring location when their larger competitors have engaged in a high volume of strategic actions in that same location.

Smaller Competitors' Positive Performance

Whereas competitors' high action volume can be interpreted as a signal of opportunities, competitors' performance in a target location can be used to evaluate one's own chance of achieving future success. Organization research has shown that rivals' performance of pursuing a certain initiative will affect a firm's own inclination to pursue the same initiative (e.g., Haunschild & Miner, 1997; Lu, 2002; Schwab, 2007). Extending this established finding, we distinguish between competitors' positive performance (operating profitably in a target location) and their negative performance (operating at a loss in the target location). Although such a distinction has been rare in the literature, it is essential because firms are selectively influenced by the successful or unsuccessful experience of different rivals with varying relative sizes—as will be illustrated below.

Reference to smaller competitors' positive performance enables decision makers to reason that their own company has a good chance of achieving the same successful outcome in the future. Firms entering an overseas location are constrained by their lack of local embeddedness, and entrants' existent strength is crucial for them to compensate for their liability of foreignness (Hymer, 1976; Zaheer & Mosakowski, 1997). Because smaller size is associated with less resource endowment and a lower level of existent advantage, smaller companies often find it more difficult to operate effectively overseas (Caves, 2007). Knowing that even smaller, less-endowed competitors have managed to overcome obstacles in an overseas location, decision makers of a larger, more advantaged company can reason that their own company has sufficient capability to contest in that domain (Chen et al., 2007) and expect a good chance of achieving future success there. This notion was illustrated in our study by a project manager:

> They [a successful small competitor] had their uniqueness. That's why they succeeded while we created a mess. But still, our boss [a senior vice president] kept pushing us to play big, "If they could make it, I don't see why we can't. Our resources are beyond double, and, more importantly, we have better people like you guys." It is difficult to argue otherwise—I mean, who would dare to come forward and tell the boss that we do not actually have better people?

Accordingly, we expect that escalation behavior is especially likely to occur when one's smaller competitors have been operating profitably in a target location. In this situation, decision makers can refer to smaller competitors' successful experience as a supportive indicator of their company's own chance of success, thereby providing them with a justification to mobilize further resource

support for additional strategic actions. Conversely, when smaller competitors have not succeeded in the target location, decision makers will lack effective evidence that their company is above the capability threshold at which success in an overseas location becomes achievable (Terlaak & King, 2007). In this scenario, the return on making additional moves—as attempts to overcome obstacles—will appear more uncertain (Adner & Levinthal, 2004). Therefore, decision makers will find it more difficult to argue strongly in favor of further resource commitment (Guler, 2007; Zardkoohi, 2004).

On the other hand, larger competitors' positive performance might also be interpreted as a supportive indicator that a focal firm can perhaps overcome the obstacles in a location under consideration. However, since larger rivals have greater resources to foster overseas development and are in a better position to compensate for their liability of foreignness (Hymer, 1976; Zaheer & Mosakowski, 1997), they are more likely than a smaller focal firm to succeed (Caves, 2007). In other words, larger competitors' successful experience can be attributed to their endowment advantage rather than to the manageable conditions in a target location. Hence, decision makers can hardly refer to larger, better-endowed competitors' profitable operations and make a strong argument that their company is capable of achieving the same success. Although larger rivals' successful experience might still affect escalation behavior, such an influence is expected to be weaker in comparison with the case of smaller rivals. We therefore highlight the influence of smaller competitors' positive performance on firms' escalation behavior, and propose:

Hypothesis 2. Firms are more inclined to undertake new strategic actions in a loss-incurring location when their smaller competitors have been operating profitably in that same location.

Larger Competitors' Negative Performance

Thus far, our analysis has concentrated on supportive cues indicating a good prospect of persistency. Here, we consider unsupportive cues pointing to an unfavorable expectation of return on further commitment. Analyzing the effect of unsupportive cues helps to better unveil the behavioral drivers behind escalating commitment. If firms' subsequent investment decisions are predominantly driven by pro-commitment biases (e.g., Arkes & Blumer, 1985; Nisbett et al., 1982; Staw, 1976), unsupportive cues are expected to display minimal effect on subsequent investment, as decision makers may direct organizational attention toward supportive cues while neglecting—or even selectively ignoring—counterevidence (Cyert & March, 1963; Ocasio, 1997). Conversely, if rational, objective deliberations do play a part in decision making, unsupportive cues should receive organizational attention and reduce firms' commitment to an underperforming initiative.

We have reasoned that smaller competitors' positive performance can encourage persistency as decision makers gain confidence in achieving the same success. On the flip side, larger competitors' negative performance may discourage subsequent commitment. When larger rivals have performed poorly in an overseas location despite being more resourceful and advantageous (Caves, 2007), managers of a smaller, less-endowed firm are confronted with the uncomfortable possibility that the conditions in the target location are overly challenging. As such, their company does not have sufficient capability to contest in that domain (Chen et al., 2007), and their chance of achieving future success is slim. As long as a firm pays attention to unsupportive cues, larger competitors' negative performance will create an unfavorable expectation for return on further commitment, thereby reducing the firm's inclination to engage in new strategic actions.

On the other hand, although smaller competitors' negative performance might also be interpreted as an unsupportive cue, these rivals' lack of success can be attributed to inferior resource endowment instead of challenging local conditions. As such, decision makers of a larger focal firm can still reason that the target location is promising because their own company is comparatively more capable of obtaining a positive outcome. Moreover, unsuccessful experience of smaller competitors may be deemed by a better-endowed focal firm as an opportunity to further its lead vis-à-vis the weakened rivals (Scherer & Ross, 1990). Such an interpretation will encourage—rather than reduce—further commitment by heightening the expected return from future success (Ferrier et al., 2002).

Since smaller rivals' unsuccessful experience is subject to alternative interpretations, we expect its behavioral influence to be more indirect and limited in comparison with the case of larger rivals. Accordingly, our third hypothesis highlights the

influence of larger competitors' negative performance on firms' escalating tendency. Specifically, we predict:

Hypothesis 3. Firms are less inclined to undertake new strategic actions in a loss-incurring location when their larger competitors have been operating at a loss in that same location.

METHODS

Our sample consisted of leading Taiwanese companies in three segments of the IT industry: personal computer, mainboard, and network device manufacturing. We traced these firms' investment activities in numerous locations in China during the period of 1998 to 2011. Unlike in neighboring countries such as Japan and Korea (the IT industries of which were dominated by large, diversified conglomerates), Taiwan's IT companies had a comparatively modest size and typically specialized in a specific main product (Dedrick & Kraemer, 1998). Firms competing in the same product segment paid particularly close attention to each other's activities in China—the single most important destination for overseas investment. China not only provided attractive production sites, but also increasingly became an important end market in itself. Economic development accelerated in numerous locations, and local demand for IT products surged. Hence, our sample firms set their eyes on both local factor and product markets when entering a certain location in China. Although few companies had a major presence in China in the mid-1990s, by the end of 2011, our sample firms' investment in China accounted for more than 70% of their total investment overseas.

Data

We began our data collection by examining all companies traded on the two domestic stock exchanges: the Taiwan Stock Exchange (for larger, more established companies) and the Gre Tai Securities Market (for smaller and/or start-up companies). From there, we identified 60 companies whose main products (products generating the highest revenues) fell into one of the three selected segments. Although these companies sometimes expanded into related product segments as they grew larger, they generally displayed a high level of product specialization. On average, revenues from our sample companies' main products accounted for 67% of their total revenues. Main products of firms in the three selected segments were laptop computers, desktop mainboards, and local area network devices (including customer premises equipment), respectively. According to the Institute for Information Industry (2011), Taiwan's IT industry produced more than 90% of these main products worldwide in 2010.[1] Because our sample firms specialized in the same main products of which they collectively held a dominant global share, they were inclined to identify one another as arch rivals—and key reference points for decision making. Our analysis thus focused on Taiwanese firms in each of the three selected segments as primary rivals, known to benchmark against one another in the course of investing in China. The presence of other IT companies (indigenous and other foreign firms in China) as potential or minor competitors was captured separately by a control variable.

Next, we collected data on Taiwanese IT companies' actions and performance in China from two main sources. First, the Investment Commission (Taiwan's regulatory agency for overseas investment) reviewed and kept records of all public companies' investment proposals. This data source provided an overview of the set of strategic actions that a company planned to undertake. Second, Taiwan's listed companies reported their activities and performance in China to the Market Observation Post System (an information platform managed by the Taiwan Stock Exchange) on a quarterly basis. This data source revealed when an action actually took place and how a company has performed in China. Together, the two data sources recorded a total of 1,679 actions taken by 51 companies in China.[2] Data from the two main sources were consistent: we were able to match 1,536 actions found in both sources, and all these actions were kept for further consideration. As to the 143 actions found only in one data source but not in the other, we

[1] Our dataset contained all firms holding at least 1% worldwide share of the main products. Smaller firms were also included in our dataset if they were listed, but data on small and unlisted firms were not available.

[2] Nine of the 60 companies identified earlier did not appear to undertake any strategic actions in China during our observation period. Although these firms might not be completely passive (we could tell from their quarter and annual reports that at least four of them had certain operations in China), their investments in China were probably limited and below the threshold of formal disclosure.

searched companies' quarter and annual reports for additional information, and kept the 59 actions that were documented in the reports. The remaining 84 cases were dropped, as they might reflect unimplemented plans or actions of minor significance, leaving 1,595 actions for further data processing.

Dependent Variable

Our dependent variable concerns a firm's tendency to undertake new strategic actions in a certain location despite its poor performance there. We defined a location in China as a province (e.g., Guangdong and Jiangsu) or municipality (e.g., Shanghai and Beijing). To analyze escalation behavior, we focused on the scenarios in which a firm had been operating at a loss ever since its initial entry into a location,[3] and estimated its hazard rate of undertaking at least one new action at a given point in time (measured in quarters) using the Cox semiparametric model (Cox, 1975). Under the event history analysis framework, "action rate" denotes the probability that an action event will occur in the next instance, provided that no event has occurred up to time t within a given spell (i.e., instantaneous probability of event occurrence). Of the 1,595 actions identified earlier, 680 were taken by firms while their operations in a location remained loss-incurring. These 680 actions spanned across six distinct types, including 164 inbound logistics actions (sourcing new local inputs), 222 product actions (producing additional products locally), 89 capacity actions (expanding local manufacturing facility), 108 outbound logistic actions (expanding local storage, shipping, or distribution facility), 59 technology actions (establishing a local research unit), and 38 partner actions (forming a local joint venture). These actions were strong indicators of continuing commitment because they had profound strategic implications and required substantial resource commitment to carry out. Our data suggested that the median amount of investment associated with each action event was as large as TWD $39.6 million (about USD $1.3 million).[4]

Firms in our sample could undertake new strategic actions for multiple times while they remained operating at a loss in a certain location. To analyze their repeated action events in a location, we implemented gap time models, in which a "spell" was captured as the time duration since the last event.[5] Each spell started immediately after a firm's previous action event in a location. For a firm's first action event in a location, the corresponding spell started right after its initial entry. To avoid observations being left truncated, when a spell started before 1998, we traced the historical record back to 1992 (before which date no sample firms operated in China) so that we could determine the precise gap time. A spell ended in an event when a firm undertook at least one new action in a location while it was still operating at a loss there. Otherwise, the observation was right censored, either because a firm was able to profit from a location for the very first time, when a firm exited a location, or at the end of our observation period. As our sources were updated quarterly, our data contained 1,920 firm–location–quarter observations based on the 131 firm–location histories of 51 firms in 16 locations. Of these observations, 353 were associated with action events, which defined 464 distinct spells. Of these spells, 75 were right censored due to turning profitable, and another 13 were right censored due to exits. (A sample illustration of our data structure is provided in Appendix A2.) Let $h[t \mid Z_i(t)]$ be the action rate of firm i in a given location at gap time t and let $Z_i(t)$ be the vector of covariates. Our Cox models can be expressed as:

$$h[t \mid Z_i(t)] = h_{0,k}(t)\exp[\beta' Z_i(t)]$$

In this equation, the action rate is represented as covariates modifying multiplicatively the baseline hazard rate $h_{0,k}(t)$. We fitted an individualistic baseline rate for firms' first, second, third . . . nth actions in a location. In other words, our models were stratified in accordance to the cumulative number of actions that a firm had ever taken (de-

[3] Thus, we excluded 11 firm–location histories where a firm's initial entry into a given location was profitable before any further actions.

[4] Our dataset contained rich information on activities related to establishing manufacturing sites in China. By contrast, information on activities related to exploring and serving local customers was more limited, because such activities typically involved lower capital investment by our sample firms and were less disclosed.

[5] We also implemented elapsed time models in which a spell was captured as the time duration since initial entry into a location (and hence the data took the form of multiple events per spell). These alternative models yielded similar results. We did not adopt elapsed time models as our primary method of analysis because they impose a seemingly unrealistic assumption that all subsequent commitment decisions in a location were evaluated on the basis of the same, continuous time clock.

noted by subscript k) since its initial entry into a given location. Semiparametric models allow researchers to make inferences on the effects of covariates without specifying the exact functional form of baseline rate. As such, stratifying the baseline rate provides a simple yet powerful way to account for the situation in which, depending upon the cumulative number of previous actions, decisions on further commitment might be evaluated differently. Finally, pooling multiple observations of the same firms might violate the common assumption of observation independence. To mitigate potential biases, we utilized robust clustered estimators of standard errors to adjust for correlated observations associated with the same companies (Williams, 2000).

Explanatory Variables

Larger competitors' action volume. Our first hypothesis pertained to the influence of larger competitors' active involvement in a location. We evaluated the relative size between two companies by comparing their average revenues over the past two years. Accordingly, larger competitors of a firm were defined as other Taiwanese companies belonging to the same product segment and generating comparatively higher revenues. We identified all the actions carried out by the focal firm's larger competitors in a given location in China, and captured each competitor's action volume as the total number of actions taken by a competitor in the target location over the past two years (Chen et al., 2010; Ferrier, 2001; Yu et al., 2009). Each competitor's action volume was then divided by its overall size (logarithm of revenues in TWD (million)) to adjust for the general correlation between resource endowment and activeness (Miller & Chen, 1994; Young et al., 1996). Finally, we computed the variable of larger competitors' action volume as the average of larger competitors' size-adjusted action volume in a given location during the two-year moving window.[6]

Smaller competitors' positive performance. Our second hypothesis pertained to the influence of smaller competitors' successful experience in a location. A firm's smaller competitors were defined as other Taiwanese companies belonging to the same industry segment and generating comparatively lower revenues. Each smaller competitor's performance was captured as the rate of return on its invested capital in a given location in China over the past two years.[7] Some of a focal firm's smaller competitors might operate with profit, while others might operate at a loss. In our main analysis, we computed the variable of smaller competitors' positive performance as the average rate of positive return by those smaller competitors that were operating with profit. (A sample illustration is provided in Appendix A3.) In cases where no smaller competitors of a firm were able to profit from the target location, we assigned zeros to this measure to indicate the non-existence of supportive cues. Because the distinction between competitors' positive and negative performance has been rare in the literature, we also constructed a range of alternative indicators for a robustness test. Results based on these additional indicators will be reported and discussed later in this paper.

Larger competitors' negative performance. Our third hypothesis pertained to the influence of larger competitors' unsuccessful experience in a location. As in the case of smaller competitors, some of a firm's larger competitors might profit from a given location in China, while others might operate at a loss there. To construct the variable of larger competitors' negative performance for our (main) analysis, we first computed the average rate of negative return by those larger competitors that were operating at a loss. Then, we removed negative signs from the average figures; as such, competitors' larger losses corresponded to higher positive values of the resulting measure of negative performance. In cases where no larger competitors of a firm were operating at a loss, we assigned zeros to this measure to indicate the non-existence of unsupportive cues.

Control Variables

The baseline rate of our Cox models was stratified by the cumulative number of actions that a

[6] As a robustness test, we also constructed all explanatory variables using alternative moving windows of 1.5 and 2.5 years, and obtained nearly identical results.

[7] Our data recorded firms' performance in China at three analytical levels: overall performance across China, performance in different locations in China, and performance of individual subsidiaries in a location. "Overall China performance" failed to reflect regional differences. Furthermore, "subsidiary performance" was difficult to interpret and compare: as multiple subsidiaries in the same location typically served different business functions, their performance figures were largely determined by the diverse practices of transfer pricing.

firm had ever taken since its initial entry into a given location. Further, we constructed a control variable—the *focal firm's action volume*—by counting the number of actions taken by the firm over the past two years and then adjusting the figure by firm size (logarithm of revenues in TWD (million)). A stratified baseline rate does not distinguish a firm's recent actions from its actions in the more distant past. By contrast, this control variable accounts for the possibility that a firm's recent actions might have an additional impact on subsequent decision making.

Our hypotheses highlighted the behavioral influence of larger competitors' action volume, smaller competitors' positive performance, and larger competitors' negative performance. In contrast, we expected *smaller competitors' action volume*, *larger competitors' positive performance*, and *smaller competitors' negative performance* to each play a less prominent role. Still, we constructed these three variables and included them in the regression analysis as controls.

Certain characteristics at the whole corporation level can potentially influence firms' commitment to a certain location. *Overall corporate performance* measured a firm's total return on assets. *Overall firm size* measured a firm's total revenue (in TWD (million); logarithmic transformation was applied). Next, a firm might operate in multiple locations in China at a time, and its investment in a target location might be influenced by its operations elsewhere. We included two variables to account for this possibility. *Experience in other locations in China* captured the time elapsed (in years) since a firm's first entry into any other locations in China, while *performance in other locations in China* captured the average rate of return on the firm's invested capital in all other locations in China. Further, a firm's overseas operations in other host countries might influence its investment activities in China. We measured a firm's *degree of internationalization* as its foreign assets (outside the greater China area including Hong Kong) divided by its total assets. One variable—experience in other locations in China—was updated at the end of each quarter. The remaining time-varying variables specified above were all measured as the average figure during a moving window of two years prior to a given time.

We controlled for the *number of competitors in a location*, which captured the sheer number of other Taiwanese companies that specialized in the same product segment and operated in the target location in China. An increasing number of competitors in a location might induce a firm to increase its commitment there (Knickerbocker, 1973; Lieberman & Asaba, 2006). *Multi-location contact in China*, on the other hand, was computed as a firm-in-location level variable measuring the average number of other locations in which a firm encountered the same set of Taiwanese competitors that also operated in the target location (Gimeno & Jeong, 2001). Contact across multiple locations might lead to mutual forbearance in the form of reduced activeness (Yu et al., 2009). These two control variables were updated at the end of each quarter. In addition, although Taiwanese IT companies in the same industry segment were inclined to identify one another as primary rivals, their behavior might also be influenced by indigenous and other foreign firms in the IT industry. We thus included a control variable, labeled *other IT companies*, to capture the number of all domestic and foreign IT establishments that were present in a target location. Additional data required for the last control variable were obtained from various yearly issues of the *China Statistical Yearbook*.

Finally, firms' commitment decisions might be influenced by unobserved factors associated with a particular industry segment, time period, or location. In our regression models, we included an array of segment, year, and location dummies to account for such potential heterogeneity.

RESULTS

Table 1 reports the summary statistics of variables used in this study. Table 2 presents the Cox regression analysis results. Model 1 in Table 2 includes all control variables. The effect of a firm's own action volume is not statistically significant, largely because the stratified baseline rate also absorbed the effect of the firm's prior actions. Smaller competitors' action volume, larger competitors' positive performance, and smaller competitors' negative performance do not display a significant influence, suggesting that these potential cues might not be used to inform commitment decisions. Multi-location contact in China has a positive yet insignificant influence on activeness, although we expected it to decrease a firm's activeness due to the mutual forbearance effect. Perhaps in contexts such as China, which are characterized by both rich opportunities and high uncertainty, decision makers are anxious to avoid lagging behind rivals that they have repeatedly encountered in the

TABLE 1
Descriptive Statistics

Variable	Mean	*SD*	Min.	Max.	Correlation													
					1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Larger competitors' action volume	0.26	0.33	0.00	1.77														
2. Smaller competitors' positive performance	0.04	0.07	0.00	0.74	.11													
3. Larger competitors' negative performance	0.06	0.08	0.00	0.82	.41	.08												
4. Focal firm's action volume	0.40	0.71	0.00	7.17	.29	.09	.21											
5. Smaller competitors' action volume	0.34	0.56	0.00	4.08	.22	.18	.21	.07										
6. Larger competitors' positive performance	0.04	0.05	0.00	0.69	.46	.13	.29	.15	.08									
7. Smaller competitors' negative performance	0.06	0.07	0.00	0.80	.04	.21	.14	−.03	.31	.06								
8. Overall corporate performance	0.03	0.09	−0.52	0.31	−.10	.12	−.10	.07	.10	−.19	.19							
9. Overall firm size (log TWD (million))	9.45	2.06	4.05	13.98	−.24	.02	−.25	−.24	−.09	−.21	.15	.35						
10. Experience in other locations in China	4.40	4.02	0.00	19.00	−.33	−.15	−.29	−.24	−.20	−.12	−.14	−.04	.40					
11. Performance in other locations in China	−0.01	0.06	−0.47	0.26	−.08	.04	.01	−.07	−.11	−.01	.04	.12	.08	.12				
12. Degree of internationalization	0.02	0.03	0.00	0.16	−.03	−.02	.04	−.08	.03	−.06	.02	−.12	−.05	.06	−.06			
13. No. of competitors in a location	4.78	3.85	0.00	14.00	.42	.33	.42	.17	.28	.49	.31	−.04	−.23	−.28	.01	−.09		
14. Multi-location contact in China	0.55	0.81	0.00	5.00	−.14	−.05	−.12	−.14	−.11	.00	.06	.09	.57	.49	.06	.00	−.14	
15. No. of other IT companies (/100)	5.19	3.27	0.36	15.70	.32	.15	.14	.07	.13	.36	.04	−.10	−.18	−.06	.00	−.10	.51	−.05

Note: n = 1,920 firm–location–quarter combinations (based on 131 firm–location histories of 51 firms in 16 locations). Correlations with an absolute value above 0.05 are significant at the 5% level.

TABLE 2
Cox Models for Firms' Action Rate

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Larger competitors' action volume		0.495*			0.574**
		(0.214)			(0.194)
Smaller competitors' positive performance			1.776**		1.799**
			(0.572)		(0.561)
Larger competitors' negative performance				−1.422†	−1.645*
				(0.818)	(0.823)
Controls					
Focal firm's action volume	0.123	0.102	0.110	0.133†	0.097
	(0.080)	(0.087)	(0.083)	(0.074)	(0.081)
Smaller competitors' action volume	−0.061	−0.070	−0.105	−0.057	−0.110
	(0.120)	(0.124)	(0.123)	(0.119)	(0.127)
Larger competitors' positive performance	0.310	−0.208	0.159	0.420	−0.338
	(1.192)	(1.282)	(1.194)	(1.143)	(1.220)
Smaller competitors' negative performance	0.238	0.521	0.064	0.205	0.347
	(0.722)	(0.702)	(0.794)	(0.716)	(0.756)
Overall corporate performance	2.350**	2.196**	2.502**	2.380**	2.367**
	(0.785)	(0.796)	(0.776)	(0.794)	(0.796)
Overall firm size	0.117†	0.135*	0.101	0.106	0.108†
	(0.069)	(0.068)	(0.068)	(0.069)	(0.065)
Experience in other locations in China	−0.044†	−0.039	−0.045†	−0.047†	−0.042†
	(0.024)	(0.024)	(0.024)	(0.024)	(0.025)
Performance in other locations in China	0.082	0.060	0.007	0.308	0.226
	(0.956)	(0.943)	(0.958)	(0.997)	(0.981)
Degree of internationalization	3.474	3.017	3.430	3.733	3.197
	(2.379)	(2.311)	(2.315)	(2.435)	(2.340)
No. of competitors in a location	0.104*	0.091*	0.098*	0.112**	0.093*
	(0.043)	(0.043)	(0.043)	(0.043)	(0.044)
Multi-location contact in China	0.287	0.284	0.288	0.290	0.291
	(0.203)	(0.207)	(0.197)	(0.199)	(0.195)
No. of other IT companies	−0.150	−0.144	−0.155	−0.159	−0.159†
	(0.100)	(0.101)	(0.097)	(0.098)	(0.095)
Segment, year, and location dummies	Included	Included	Included	Included	Included
Log likelihood	−846.9	−844.3	−844.2	−845.6	−839.7
LR χ^2 against null model	147.0**	147.5**	156.3**	150.9**	159.2**
Akaike information criterion	1757.8	1754.6	1754.5	1757.2	1749.4

Note: Gap time models for repeated action events. Baseline rate are stratified by the cumulative number of actions. Robust standard errors, clustered by firms, are in parentheses.

†$p < 0.1$

*$p < 0.05$

**$p < 0.01$; all two-tailed tests

pursuit of new business potential (Anand, Mesquita, & Vassolo, 2009). Overall corporate performance, firm size, and the number of (Taiwanese) competitors in a location are found to increase action rate. Experience in other locations in China displays a negative effect, suggesting that firms are less inclined to persist with a loss-incurring location if they have being operating elsewhere.

Hypotheses Testing

Consistent with the first hypothesis, larger competitors' action volume displays a significant positive effect in both Models 2 and 5 (p = 0.021 and 0.003 in two-tailed tests). Due to the multiplicative specification in the Cox models, the size of this effect is evaluated in relative terms—through comparing action rate multipliers under different scenarios of interest (Cleves, Gould, Gutierrez, & Marchenko, 2010). We consider three stylized scenarios: (1) when larger competitors' action volume takes a zero value, (2) equals the average of nonzero cases, and (3) is as high as one standard deviation above the mean. The average scenario is used as the baseline for comparison. Relative to this baseline scenario, a firm's action rate decreases by

22% when larger competitors' action volume takes a zero value, and increases by 21% when this predictor takes a high value (based on estimates in Model 5). Such a range of variation in action rate (from −22 to +21 %) is economically consequential, for actions in our dataset reflect considerable investment (a median of TWD $39.6 million, or USD $1.3 million, for each action event).

Consistent with the second hypothesis, smaller competitors' positive performance displays a significant positive effect in both Models 3 and 5 (p = 0.002 and 0.001). Again, the size of this effect is evaluated with reference to three stylized scenarios: (1) when smaller competitors' positive performance takes a zero value, (2) equals the average of non-zero cases, and (3) is as high as one standard deviation above the mean. Relative to the average (baseline) scenario, a firm's action rate decreases by 17% when smaller competitors' positive performance takes a zero value, and increases by 18% when this predictor takes a high value.

Finally, consistent with the third hypothesis, larger competitors' negative performance displays a significant negative effect in both Models 4 and 5 (p = 0.082 and 0.046). In terms of effect size, relative to the average scenario, a firm's action rate increases by 19% when larger competitors' negative performance takes a zero value, and decreases by 12% when this predictor takes a high value.

Additional Analyses

Proportional hazard assumption. One key assumption underlying Cox models is that the hazard rate can be specified as covariates multiplicatively modifying the baseline hazard function: given two observations with particular values of covariates, the ratio of the estimated hazards over time is assumed to be constant within each stratum. Yet, the proportional hazard assumption might not be valid for certain covariates. We tested this assumption for all time-varying covariates using the partial residuals developed by Schoenfeld (1982), and did not find the assumption to be violated for any variables.

Related characteristics of action repertoire. When theorizing about competitors' action repertoire, we have focused on action volume—the sheer number of all actions taken by each rival within a given time period. In our main analysis, we normalized competitors' action volume by their size. As a robustness test, we also constructed a simple count measure without the size adjustment. Further, competitive dynamics research has examined a number of action repertoire characteristics that are conceptually similar to (and empirically correlated with) action volume. Accordingly, we constructed measures to capture competitors' action magnitude (the total amount of investment associated with all the actions in a repertoire, adjusted for each competitor's size), action complexity (an inversely coded Herfindahl index reflecting the extent to which a rival's actions are distributed across different types; see Ferrier, 2001), and action inertia (an inversely coded activeness index adjusted for the frequencies of different action types; see Miller & Chen, 1994). All these alternative measures yielded consistent results.

Alternative indicators of competitors' performance. Competitors of a firm might perform differently in a given location—some are able to profit from that location, while others operate at a loss. Our empirical analysis has distinguished between positive and negative performers. In addition, we constructed four sets of alternative indicators. (A sample illustration is provided in Appendix A3.) First, we distinguished between larger/smaller competitors whose performance were above and below the median value, and measured the average performance of the relatively better and worse performers. Second, we measured the performance of the best and worst performers among a focal firm's larger/smaller competitors. Third, we calculated the average performance of all larger/smaller competitors, and then truncated the average figures above and below zero to form separate variables of competitors' success and failure. For these three sets of variables, indicators of rivals' low performance were reverse coded so that higher values denote poorer performance. Fourth, we constructed dummy indicators of competitors' success, whose value equals one if at least one larger/smaller competitor of a focal firm has been able to profit from a given location, and equals zero otherwise. Dummy indicators of competitors' lack of success were constructed likewise. As shown in Table 3, all of the four alternative indicators of smaller competitors' positive performance display a significant effect, whereas the first two alternative measures of larger competitors' negative performance display a significant effect.

Resource diversion as an alternative explanation. We have theorized that larger competitors' action volume can reveal their private information on location attractiveness. Nonetheless, sometimes rivals might be interested in one location but pretend to be active in another place, with the inten-

TABLE 3
Cox Models Using Alternative Indicators of Competitors' Performance

Variable	Model 6 (better/worse)	Model 7 (best/worst)	Model 8 (truncated)	Model 9 (yes/no)
Larger competitors' action volume	0.536**	0.505**	0.544**	0.527*
	(0.194)	(0.195)	(0.194)	(0.206)
Smaller competitors' positive performance (alt.)	1.493**	0.705†	3.147**	0.315*
	(0.389)	(0.382)	(0.813)	(0.139)
Larger competitors' negative performance (alt.)	−1.039*	−0.850*	−1.730	−0.082
	(0.518)	(0.431)	(1.264)	(0.222)
Controls				
Focal firm's action volume	0.089	0.084	0.102	0.080
	(0.087)	(0.082)	(0.085)	(0.089)
Smaller competitors' action volume	−0.093	−0.077	−0.075	−0.073
	(0.126)	(0.128)	(0.119)	(0.130)
Larger competitors' positive performance (alt.)	−0.234	−0.407	−0.766	−0.005
	(1.502)	(0.762)	(1.580)	(0.210)
Smaller competitors' negative performance (alt.)	−0.249	−0.270	0.120	−0.358
	(0.625)	(0.393)	(0.841)	(0.408)
Overall corporate performance	2.432**	2.400**	2.369**	2.152**
	(0.817)	(0.828)	(0.813)	(0.800)
Overall firm size	0.131*	0.109†	0.141*	0.114†
	(0.066)	(0.064)	(0.070)	(0.066)
Experience in other locations in China	−0.041†	−0.042†	−0.042†	−0.041†
	(0.024)	(0.024)	(0.024)	(0.024)
Performance in other locations in China	0.151	0.215	0.267	0.052
	(1.033)	(0.999)	(0.981)	(0.931)
Degree of internationalization	3.329	3.273	2.875	3.352
	(2.333)	(2.316)	(2.442)	(2.338)
No. of competitors in a location	0.099*	0.103*	0.094*	0.072
	(0.045)	(0.048)	(0.043)	(0.046)
Multi-location contact in China	0.275	0.279	0.281	0.295
	(0.205)	(0.202)	(0.199)	(0.198)
No. of other IT companies	−0.171†	−0.169†	−0.170†	−0.149
	(0.098)	(0.097)	(0.101)	(0.098)
Segment, year, and location dummies	Included	Included	Included	Included
Log likelihood	−840.3	−841.3	−840.7	−842.7
LR χ^2 against null model	161.9**	156.8**	161.1**	160.7**
Akaike information criterion	1750.6	1752.6	1751.5	1755.5

Note: Gap time models for repeated action events. Baseline rate are stratified by the cumulative number of actions. Robust standard errors, clustered by firms, are in parentheses.

†$p < 0.1$

*$p < 0.05$

**$p < 0.01$; all two-tailed tests

tion to direct other firms' resources toward the false hotspot and away from the genuine locus of interest (McGrath, Chen, & MacMillan, 1998). To evaluate whether our results will hold specifically in target locations where such "pretend activities" are less likely, we constructed a reduced sample consisting of only the four key locations in China—namely, Shanghai, Jiangsu, Guangdong, and Beijing—and excluded event histories in all other locations (accordingly, 37 of 141 firm–location histories were excluded). The four key locations were characterized by rapid economic development, and hence companies typically had a real interest in them. Results indicated that larger competitors' action volume still has a significant effect in the reduced sample—and so does smaller competitors' positive performance. But we also found that, in the four key locations, the effect of larger competitors' negative performance no longer reaches statistical significance.

Stratified models based on the length of a firm's experience in a location. Entrants inexperienced in a location might interpret negative performance feedback differently than highly experienced firms. To better account for this possibility,

we estimated models in which the baseline rate was stratified by a firm's length of experience (in years) in a location (instead of by its cumulative number of actions there). Under the alternative model specification, the effects of larger competitors' action volume and smaller competitors' positive performance are significant, but the effect of larger competitors' negative performance is not. Although this alternative specification is less adequate since Schoenfeld's test (1982) detects violations of the proportional hazard assumption, it still indicates that the effect of larger rivals' unsuccessful experience is not as robust as the influence of the other two predictors.

DISCUSSION

Prior research on escalation of commitment has focused on unveiling decision makers' personal biases (Staw, 1997), but the structural determinants of firms' escalation behavior are less well understood (Sleesman et al., 2012). Addressing this research gap, we highlight competitive market conditions as an important structural determinant. Specifically, we theorize that reference to certain rivals may provide decision makers with justifications for continuing commitment to an underperforming initiative, thereby increasing a firm's escalating tendency. On the other hand, reference to competitors may also reveal unsupportive cues, which reduces escalation behavior as long as these cues receive organizational attention. Our empirical analysis reveals strong evidence that a firm's escalating tendency is increased by larger competitors' high action volume and smaller competitors' positive performance. In contrast, larger competitors' negative performance is found to decrease escalation behavior.

In addition to overseas expansion examined in this study, other strategic endeavors—such as developing new joint ventures, diversifying into new lines of business, or stimulating organization reforms and changes—also involve sequential investment decisions and an uncertain prospect of future success. Competitive market conditions may either lock firms into these initiatives or lead them to exit as they refer to market rivals for external cues. It is unlikely that firms facing adverse performance situations will just blindly insist upon the current course. When decision makers intend to make further commitment to an underperforming initiative, they are under pressure to identify reasonable justifications that help them to convince other organizational members and stakeholders—otherwise, they will find it increasingly difficult to mobilize continuing resource support (Adner & Levinthal, 2004; Zardkoohi, 2004). As our results reveal, a firm displays a higher escalating tendency when supportive cues are available in the competitive market environment, whereas the presence of unsupportive cues decreases escalation behavior.

Beyond viewing escalation of commitment as a straightforward reflection of personal biases, our consideration of the need to "justify" suggests a range of possibilities. A firm's escalation behavior may occur as a result of rational, objective deliberations: decision makers carefully evaluate an array of external cues and conclude that the expected return on subsequent investment outweighs incremental resource cost. On the other hand, external cues may be selectively used by decision makers for self-serving purposes. It is difficult to empirically separate rational deliberations and self-serving motives as most decisions involve both (Cyert & March, 1963). Still, we might expect that, if self-serving motives dominate, decision makers could direct organizational attention toward supportive cues while ignoring counterevidence (Ocasio, 1997). In our study, larger competitors' negative performance is found to decrease a firm's escalating tendency, suggesting that unsupportive cues are not completely discarded. Nonetheless, additional analyses show that the other two predictors have a more robust effect of increasing escalation behavior, perhaps because supportive cues receive more attention. The complex picture emerging from this study urges researchers to adopt a broader view of limited organization rationality when studying escalation of commitment.

Despite recent progress in understanding the behavioral interdependence among market rivals (e.g., Hsieh & Vermeulen, 2014; Livengood & Reger, 2010; Marcel et al., 2011; Tsai et al., 2011; Zhang & Gimeno, 2010), competitive dynamics research has yet to examine firms' resource commitment specifically under adverse performance situations. In addition to providing a conceptual linkage between escalating commitment literature and competitive dynamics research, our study informs the awareness–motivation–capability perspective, a core framework in studying interfirm rivalry (Chen & Miller, 2012). Specifically, our analysis of reference point selection relates competitors' actions and performance to awareness and motivation factors, and identifies the role of relative size in capability consideration. Also, adding to the traditional emphasis on larger competitors as main reference

points (Chen et al., 2007), we show that larger and smaller rivals exert differential influence on firm behavior. Thereby, our analysis also extends the conceptualization of competitive relativity and asymmetry (Chen, 1996; Chen & Miller, 2012).

Our research offers practical implications that can assist managers in conducting competitor analysis and predicting rivalry (Chen, 1996; Tsai et al., 2011; Upson, Ketchen, Connelly, & Ranft, 2012). Specifically, the finding that larger companies' actions can trigger escalating commitment by smaller, less-endowed counterparts suggests that managers should consider the potential unintended effects of their company's actions. When an advantaged company behaves aggressively in a certain domain in an attempt to "squeeze out" weaker rivals that have been performing poorly, the opposite effect may occur: rivals interpret the moves as a signal of important opportunities and thereby commit even more deeply. Hence, the advantaged company may be better off if it refrains from undertaking bold moves and waits for low performers' competitive stand to further deteriorate. This way, the company can avoid intensifying rivalry into a mutually destructive race of premature commitment.

Limitations and Future Directions

This study focuses on competitors as external reference points for firms' commitment decisions, but we have not considered various organizational mechanisms and factors within a firm. For instance, firms with a higher level of momentum (Amburgey & Miner, 1992), inertia (Briscoe & Tsai, 2011; Kumar, 2004), or preference for the status quo (Hambrick et al., 1993) may be more ignorant to unsupportive cues on the prospect of the current course. Also, internal factors such as top management team (D'Aveni & MacMillan, 1990; Marcel et al., 2011), political or relational dynamics (Martinko, 1995; Tsai, 2002; Yin, Wu, & Tsai, 2012), and organization practices (McNamara et al., 2002) can either amplify or attenuate pro-commitment biases of individual managers, resulting in differing escalating tendency of a firm (Guler, 2007). Future inquiry into these factors can contribute to linking micro research on psychological biases with macro research on firm behavior. Relatedly, internal and external factors may exert diverging influences, and contrasting structural determinants may drive a firm to display nonlinear behavioral orientation, such that a minor variation of one contextual factor results in a sudden, discontinuous change (Gresov, Haveman, & Oliva, 1993).

If firms do decide to commit further resources to a loss-incurring location, the next issue concerns their strategies for subsequent investment. Persistency with a location may or may not imply persistency with the existing strategies in that location. Negative performance feedback can either stimulate exploration and change (Cyert & March, 1963) or result in inward looking and rigidity (Staw, Sandelands, & Dutton, 1981). In addition, if firms do change their strategies, they can either imitate or further differentiate themselves from competitors. Emulating the strategies of successful rivals enables firms to benefit from information externality and improved legitimacy (Bikhchandani et al., 1998; Lieberman & Asaba, 2006; Miller & Chen, 1996). However, successful strategies for larger or smaller rivals may be ineffective for a focal firm due to the disparity in resource endowment, organization structure, and visibility (Chen & Hambrick, 1995; Haleblian, McNamara, Kolev, & Dykes, 2012; Ndofor, Sirmon, & He, 2011). Future research can examine how firms adjust their subsequent strategies based on organizational and vicarious learning.[8]

This study examines commitment decisions specifically under negative performance situations. Under positive performance situations, firms can also use their competitors as reference points, but these external cues may not have the same behavioral implications. In our separate analysis using a sample of firms operating profitably in an overseas location, we found that larger competitors' negative performance will increase—rather than decrease—firms' inclination to undertake new strategic actions, whereas larger competitors' action volume has an insignificant effect. These observations suggest that different logics may apply for firms receiving positive performance feedback. For example, perhaps successful firms attempt to further enhance their competitive stand particularly when larger rivals are weakened (Scherer & Ross, 1990). Also, in addition to seeing larger competitors' activeness as a signal of business opportunities, successful firms may also worry that, since their own success attracts outside attention, their subsequent actions are

[8] For instance, additional analysis of our data revealed that the more strategic actions a firm had already taken in a loss-incurring location, the more likely it would alter its subsequent action repertoire and emulate the repertoires of successful competitors.

especially likely to trigger rivals' aggressive countermoves (Chen et al., 2007). Our findings present an interesting contrast to prior competitive dynamics research—which has yet to distinguish between negative and positive performance situations (Chen & Miller, 2012)—and provide an informative starting point for future inquiry into how competitors as reference points may be used differently by firms under varying performance situations.

Our empirical analysis focuses on firms' investment activities in numerous locations in China. For firms in our study, China provided not only attractive production sites but also growing demand for their products. Hence, when these firms encountered one another in a certain location in China, they often competed in both local factor and product markets. This study does not consider the possibility that factor and product market rivalry may have distinct implications. For instance, whereas competition for local customers is more geographically bounded, competition for local production factors can directly affect product market rivalry elsewhere because firms can ship their production outputs across geographic boundaries. Indeed, competitive dynamics research has mainly focused on product market rivalry but rarely considered factor market rivalry (Markman, Gianiodis, & Buchholtz, 2009). Future studies can look into the distinction and interplay between the two arenas.

When entering and investing in an overseas location, firms can choose among alternative entry modes, including greenfield investment, joint venture, and acquisition (Barkema & Vermeulen, 1998). Over time, some joint ventures may be converted to wholly owned subsidiaries as firms increase their commitment to a target location (Puck, Holtbrügge, & Mohr, 2009). The current study does not address these complexities. Future research can investigate the implications of different entry modes. For example, perhaps subsequent commitment to a loss-incurring location will be associated with different entry modes, depending upon firms' reference to competitors' entry mode choices.

In summary, this study addresses how reference to certain competitors may enable or disable decision makers to justify continuing investment in an underperforming initiative. Our analysis identifies competitive market conditions as an important structural determinant of escalating commitment. In so doing, we construct a conceptual bridge between escalation behavior literature and competitive dynamics research.

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APPENDICES

A1. Background of Interviewees

Functional Area	Major Responsibility	Industry Segment	Interview Date (YYYY-MM-DD)
1. General management	Overall operations of the company	Network device	2011-05-19
2. General management	Regional operations (China)	Personal computer	2012-04-24
3. General management	Regional operations (China)	Mainboard	2011-10-07
4. Finance	Financial planning	Personal computer	2012-04-24
5. Operations	Supply chain management	Mainboard	2012-04-26
6. Operations	Manufacturing	Network device	2011-10-04
7. Marketing and sales	Relationship management (OEM/ODM customers)	Personal computer	2011-10-05
8. Marketing and sales	Channel development (China)	Network device	2012-04-25
9. Research and development	New product development	Personal computer	2011-05-16
10. Project management	Horizontal coordination (for existing and new product lines)	Mainboard	2011-10-07
11. Project management	Horizontal coordination (for investment projects in China)	Mainboard	2012-04-26
12. Staff	Administrative support for top management team	Personal computer	2012-04-24
13. Staff	Competitor and market analysis	Mainboard	2011-05-20
14. Staff	Financial analysis and budgeting	Network device	2012-04-25

Note: The three quotes cited in the paper were from interviewees 12, 4, and 11, respectively.

A2. Example: A Firm–Location History

Firm	Location	Calendar Time (year, quarter)	Elapsed Time	Event	Spell	Gap Time	Covariates	Remark
#7	#9	2001Q3						Initial entry
#7	#9	2001Q4	1	0	#1	1	$X(t)$	
#7	#9	2002Q1	2	0	#1	2	$X(t)$	
#7	#9	2002Q2	3	1	#1	3	$X(t)$	1st action event
#7	#9	2002Q3	4	0	#2	1	$X(t)$	
#7	#9	2002Q4	5	0	#2	2	$X(t)$	
#7	#9	2003Q1	6	0	#2	3	$X(t)$	
#7	#9	2003Q2	7	1	#2	4	$X(t)$	2nd action event
#7	#9	2003Q3	8	0	#3	1	$X(t)$	
#7	#9	2003Q4	9	0	#3	2	$X(t)$	
#7	#9	2004Q1						Right censoring

A3. Example: Measuring Smaller Competitors' Positive Performance

Consider four smaller competitors with the following rate of return: −0.08, 0.01, 0.02, and 0.03. The average rate of return of all of them is −0.005. Such a figure assumes that the performance outcomes of all rivals are equally informative. But, as the successful experience of smaller rivals is expected to receive particular attention, we measured positive performers' average rate of return as the main predictor. Here, the variable of smaller competitors' positive performance takes the following value:

AVERAGE(0.01, 0.02, 0.03) = 0.02

As a robustness check, we also constructed four alternative indicators (used in Models 6 to 9). In the current hypothetical example, the four alternative measures take the following values:

AVERAGE(0.02, 0.03) = 0.025
MAX(−0.08, 0.01, 0.02, 0.03) = 0.03
MAX[0, AVERAGE(−0.08, 0.01, 0.02, 0.03)] = MAX(0, −0,005) = 0
IF[MAX(−0.08, 0.01, 0.02, 0.03) > 0] = IF(0.03 > 0) = 1