

GOING INTERNATIONAL AND AFTERWARDS

by

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by

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## GOING INTERNATIONAL AND AFTERWARDS

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This dissertation includes three essays that cover various aspects of doing business abroad, namely internationalization, international risk-taking, and international risk management. In the first essay we mainly focus on firm internationalization. The study starts by questioning the different behavioral as well as performance implications of perceived and objective competition. We conjecture that firms respond to competition based on how intense they perceive it to be, which determines their behavior and ultimately performance. However, firms cannot always accurately assess the intensity of objective competition. Such misperception (i.e., competition gap) will likely determine the effectiveness of firm behavior in responding to perceived competition. Based on a survey dataset covering 26 transition economies, we find empirical results that corroborate our idea. Specifically, we show a mediated relationship where perceived competition push firms to pursue outside opportunities (i.e., internationalize), which leads to better performance. Moreover, we find that competition gap positively moderates the latter part of the mediated relationship.

The second essay examines firms' international risk-taking activities in the context of the U.S. upstream oil and gas industry. Specifically, we explore how U.S. upstream oil and gas firms

respond to domestic factor market competition centered on finite proved reserves with their investment behaviors in domestic as well as in foreign markets. Our research delivers one clear message: firms engage in investment activities that enable them to avoid direct factor market competition. Within the domestic market, we conjecture that firms facing competition will increase their investment in riskier activities in pursuit of resources. Beyond the domestic market, firms are likely to avoid competition by seeking opportunities abroad; yet, they selectively do so by entering low-risk countries in search of resources. Once they enter low-risk countries, firms further engage less in risk-taking activities. Empirical analyses testing our hypotheses corroborate our ideas.

Finally, the third essay looks into how firms management international risks. This study examines how U.S. multinational enterprises (MNEs) strategically respond to the risk of war in South Korea, which is prompted by North Korea's continued threatening actions. We compare predictions of real options theory and risk diversification theory, both of which offer differing predictions on how MNEs utilize their global networks of subsidiaries when managing host country risks. Empirical results show that U.S. MNEs adopt the portfolio investment strategy (based on risk diversification theory) when facing the risk of war. However, we find that while the ownership structure of operations (wholly owned or joint venture) in South Korea does not moderate U.S. MNEs' strategic choices, U.S. MNEs with more available foreign markets tend to shift toward operational flexibility (based on real options theory). By leveraging a unique context in which the risk of war influences MNEs' strategic behaviors, we contribute to the literature by showing that MNEs' operational flexibility and portfolio management strategies may become interchangeable, depending on the foreign investment of the MNEs' configurations.

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**CHAPTER 1**  
**PERCEIVED AND OBJECTIVE COMPETITION:**  
**THE MODERATING ROLE OF COMPETITION GAP ON FIRM PERFORMANCE**

Abstract

The current study starts by questioning the different behavioral as well as performance implications of perceived and objective competition. We conjecture that firms respond to competition based on how intense they perceive it to be, which determines their behavior and ultimately performance. However, firms cannot always accurately assess the intensity of objective competition. Such misperception (i.e., competition gap) will likely determine the effectiveness of firm behavior in responding to perceived competition. Based on a survey dataset covering 26 transition economies, we find empirical results that corroborate our idea. Specifically, we show a mediated relationship where perceived competition push firms to pursue outside opportunities (i.e., internationalize), which leads to better performance. Moreover, we find that competition gap positively moderates the latter part of the mediated relationship.

## Introduction

Competition has been a central concept in the field of strategic management (Barney, 1986; Chen, 1996; D'Aveni, 1994; Porter, 1980). Naturally, the past literature has extensively examined the behavioral as well as performance implications of firm competition (Chen & Miller, 2012; Cool, Röller, & Leleux, 1999; Derfus, Maggitti, Grimm, & Smith, 2008; Gimeno & Woo, 1999; Young, Smith, & Grimm, 1996). While such studies have extended our understanding of competition, it is less clear how past studies have viewed competition in terms of its objectivity. To understand the implications of competition, should it be viewed in its objective state, or should it be understood the way the focal firm perceives it to be, which would form their subjective reality (Simon, 1947)? Up until now, our established understanding on the consequences of competition is based on either how the focal firm *perceives* the competition or based on the actual *objective* competition, depending on how different studies have empirically measured competition. We believe that this unfortunately leads to an imperfect picture of how competition may influence firms. This is because it is not difficult to imagine a situation where the competition a firm perceives is quite different from the objective reality.

Acknowledging this gap, the current study endeavors to uncover how perceived and objective competition will differentially influence the behavior and performance of firms. While we may initially think that objective competition will shape firms' behavior as a response and the resulting performance, we propose that it is actually the perceived competition that plays a central role, because for firms, their perception of the objective reality becomes their reality (Simon, 1947), which will ultimately determine their behavior. In addition, because performance

does not derive from inaction, it is this behavior in response to perceived competition that will affect firm performance.

If so, objective competition becomes less likely to directly affect firm behavior. However, there is reason to believe that objective competition will play an important role in influencing the performance of the firm. This is because, decision-makers of the firm are cognitively limited (Cyert & March, 1963; Simon, 1947), which may make it challenging for them to accurately perceive the objective competitive environment. In other words, misperception of the competition is likely to take place. This means that firms' behavior that was intended to deal with the competition may or may not be effective, depending on how accurately the firm is perceiving the competition. Therefore, objective competition contributes to firm performance, albeit not directly, but by determining the effectiveness of the firm's behavior in response to the perceived competition.

In investigating our ideas, we leverage a survey dataset covering 26 transition economies in Eastern Europe and Central Asia, otherwise known as the Business Environment and Enterprise Performance Surveys (BEEPS). This dataset enables us to test our hypotheses because it asks the respondents of the information regarding both how they perceive the competition and the objective competition (i.e., market share). Empirical results show that perceived competition is positively associated with firm behavior (i.e., export intensity), which represents firms' endeavor to pursue outside opportunities. Furthermore, export intensity partially mediates the positive association between perceived competition and firm performance (i.e., sales), showing how perception can influence firm performance through behavior. Finally, we find that the difference between perceived and objective competition (i.e., competition gap) positively

moderates the association between export intensity and firm performance. This reveals how misperception of the surrounding competitive pressure may be beneficial to the firm by pushing the firm to be better equipped and prepared in dealing with the competition.

We make three contributions to the literature. First, our study is among the first to simultaneously consider perceived and objective competition with the goal of understanding their differential implications on firm behavior and performance. While many studies have acknowledged that firms may construct their own perceptions of the competitive environment (Porac, Thomas, & Baden-Fuller, 1989; Reger & Huff, 1993) due to their inability to perfectly assess the surrounding objective competition (Cyert & March, 1963; Simon, 1947), there has been surprisingly little work that examine how they may distinctively affect the firm in a single study, which may have been due to empirical difficulties. Our study reveals that while perceived competition shapes firms' behavior and the resulting performance, objective competition plays a nontrivial role in determining performance.

Second, we explore an underexamined topic of environmental misperception of firms. By doing so, we build upon studies that emphasize the importance of understanding how the firm perceives the environment (Reger & Huff, 1993; Walsh, 1995; Zajac & Bazerman, 1991). However, our study makes a unique contribution by showing that misperception may enhance firm performance rather than deter it, which is different from the general findings of previous studies (Azar & Drogendijk, 2019; Barr, Stimpert, & Huff, 1992; Gary & Wood, 2011; Weber, Chahabadi, & Maurer, 2020). The findings point to the fact that this may depend on *how* the firm is misperceiving the environment (i.e., viewing it more negative than the objective reality), which calls for a better understanding of firms' perceptions in future studies.

Finally, we provide a comprehensive picture of the implications of competition by examining both behavioral and performance consequences. This deserves attention because absent few studies (Derfus et al., 2008; Kilduff, Elfenbein, & Staw, 2010; Ljubownikow & Ang, 2020), the majority of past studies on competition have focused only on either the behavior (Chen, 1996; Chen, Su, & Tsai, 2007; Iriyama, Kishore, & Talukdar, 2016; McCann & Bahl, 2017) or performance (Cool et al., 1999; Gimeno & Woo, 1999; Guedri & McGuire, 2011; Tsai, Su, & Chen, 2011) implications, leaving us with limited understanding of whether firms' behaviors as a response to competition is effective. Our findings based on firms' endeavor to pursue outside opportunities uncover that such strategic behaviors are indeed meaningful in enhancing firm performance in the face of competition.

#### Literature review and theoretical background

##### Perceived and objective competition

Despite the large body of works on competition (Barney, 1986; Chen, 1996; Chen & Miller, 2012; D'Aveni, 1994; Gimeno & Woo, 1999; Porter, 1980; Young, Smith, & Grimm, 1996), prior studies have paid less attention to how perceived and objective competition may simultaneously exist for firms. Rather, studies have mostly focused on either perceived or objective competition that have been reflected through their empirical approach. For example, studies closer to examining perceived competition focus on how the focal firm understands the competition, which generally involves survey methods (Iriyama et al., 2016; Kilduff et al., 2010; McCann & Bahl, 2017). On the other hand, studies related to the objective reality of competition examine information such as market share or observable competitive actions (Cool et al., 1999; Derfus et al., 2008; Ljubownikow & Ang, 2020; Tsai et al., 2011). Consequently, the two stream

of studies imply different behavioral assumptions, where the latter group of studies assume that firms are less constrained by limited information.

The current study thereby aims to establish a deeper understanding of how perceived and objective competition may differentially affect firms' behavior and performance. Our conjecture is that perception is the starting point, where it decides how firms respond to the environment, such as the surrounding competition. In other words, perceived competition determines firm behavior, which ultimately leads to performance. Indeed, scholars have proposed that "perception is the root of all organizational behavior" (Mullins, 1999: 377) and "it is generally accepted that the perceptions of environmental characteristics (rather than the "objective" characteristics of the environment) are the important properties to consider in the strategy formulation process" (Anderson & Paine, 1975: 813). This is because being cognitively limited (Cyert & March, 1963; Simon, 1947), individuals have different views of the surrounding objective reality (Barr et al., 1992; Trispas & Gavetti, 2000), where they "do not passively perceive the environment, rather he or she actively construes (attaches meaning to) perceptions." (Reger and Huff, 1993: 107).

Firm behavior and outcomes therefore become a consequence of managers' perception of the environment (Hodgkinson, 1997; Ocasio, 1997; Porac et al., 1989; Walsh, 1995). Based on this notion, studies have used perception to explain how managers construct mental models of competition (Daniels, Johnson, and Chernatony, 2002; McNamara, Luce, and Tompson, 2002; Porac et al., 1989; Reger and Huff, 1993) and examine how perception may lead to strategic outcomes (Cho and Hambrick, 2006; Osborne, Stubbart, and Ramaprasad, 2001) at the firm level (Staw, 1991). This has been reflected in the competitive dynamics literature (Chen, 1996) as

well, where competitive perception has become one of the main subjects of focus (Chen & Miller, 2012) that has led to constructs such as competitive tension (Chen et al., 2007) and competitive acumen (Tsai et al., 2011). Indeed, one could argue that the original awareness-motivation-capabilities framework (Chen, 1996) is fundamentally based on perceptions.

If so, what role does objective competition play in the story? Given our establishment of how perception will be fundamental in determining the firm's behavior in response to the environment, it is important to acknowledge that firms may not always perceive the environment in an accurate way. This is because the decision-makers of the firm will inevitably be cognitively limited with their attention scope, memories, and information processing capabilities (Cyert & March, 1963; Simon, 1947) that will make it difficult for them to fully understand the objective reality. In other words, perceived competition may be different from the objective competition, which may lead to a misperception of the environment, which we argue will have performance consequences on the firm.

#### Misperception of the environment

In the current study, we propose that misperception will affect the firm's performance (rather than the behavior), by determining the effectiveness of the firm's behavior in responding to the environment. This is because fundamentally, firms cannot behave based on misperception. If firms were aware that they were misperceiving the environment, it is likely that they will adjust their perception so that it will become more accurate in assessing their surroundings. Indeed, the conventional wisdom is that an accurate perception of the environment is always good (Barr et al., 1992; Gary & Wood, 2011), which is reflected in textbook frameworks of strategic analysis such as Porter's Five Forces or the SWOT analysis. If so, misperception becomes an *ex-post*

concept where its implications can only be observed after a firm has undertaken a certain behavior. Put differently, the influence of misperception will be reflected through firm behavior that will decide the performance of the firm. This is because the accuracy of the perception will decide how appropriate a firm's behavior was in response to the environment.

Related studies show contrasting views on how misperception of the environment may affect firm performance. On one hand, past studies propose that accurate perceptions may lead to better decision-making, which thereby results in improved performance (Barr et al., 1992; Gary & Wood, 2011). The main premise of this is that there should exist a 'fit' between the firm and the environment (Thompson, 1967), where firms should implement strategies that match their surroundings. This is because such firms will be more effective in utilizing their limited resources and attention capacity with the most relevant information by implementing better strategies that will enable them to respond to the environment. Firms misperceiving the environment, however, will inaccurately understand the necessary resources and strategies to succeed, thereby pursuing misleading directions that will be less effective in enhancing firm performance. As such, "managers who have a richer understanding of the dynamics of industry structure...can take advantage of this knowledge to improve firm performance" (Gary & Wood, 2011: 571). Similarly, recent studies provide empirical evidence on how misperception of the environment such as institutional differences (Weber et al., 2020) and cultural distance (Azar & Drogendijk, 2019) may lead to negative firm performance.

On the other hand, several studies point out that misperception may not always be detrimental to firm performance. Sutcliffe (1994: 1374) proposes that misperception "enable managers to overcome inertial tendencies and propel them to pursue goals that might look



unattainable in environments assessed in utter objectivity” while Weick (1990: 6) argues how “accuracy [in mental model] is nice, but not necessary” (Gary & Wood, 2011: 571).

Misperception may take different forms, such as perceiving the environment in an overly positive light. While this type of misperception may limit the firm from responding to the environment in an optimal way, it may have a beneficial side as well. For example, firms that overestimate their current situation may engage in more risk-taking (Ho, Huang, Lin, & Yen, 2016) and investment activities (Cervellati, Pattitoni, & Savioli, 2022) that may enhance performance. In addition, such firms may have an easier time persuading the stakeholders by presenting a rosier picture when in need of resources, which may lead to positive outcomes. For these reasons, studies that examine firms led by CEOs that are more likely to overestimate the firms’ situation show that such firms achieve better financial (Reyes, Vassolo, Kausel, Torres, & Zhang, 2020) and innovation performance (Galasso & Simcoe, 2011; Tang, Li, & Yang, 2015).

On the flip side, firms may misperceive the environment by viewing it more negatively than it is. While such misperception may induce the firm to become unnecessarily rigid and inflexible (Staw, Sandelands, & Dutton, 1981), it may also motivate the firm to go excessive lengths when responding to environmental threats that may ultimately result in positive consequences for the firm. Samsung is a good example where they have consistently adopted a ‘crisis management’ strategy to stay ahead of the competition, even when they were performing well. Kun-hee Lee, the former chairman of Samsung famously said in 1993 to “change everything other than your wives and children” (Suzuki, 2020), which well-represents the strategic direction of Samsung ever since. By always perceiving competition to be an overwhelming threat than it might actually be, Samsung has been able to push itself to the limit

to continuously innovate and improve the quality of their products to stay on top of the global competition. As of 2022, Samsung Electronics is now the 15<sup>th</sup> largest firm in Fortune Global 500.

Altogether, we propose the following theoretical model for the current study, where we expect perception of the environment (i.e., competition) will affect firm behavior and performance through firm behavior. However, the accuracy of the firm's perception of the environment will further influence firm performance by determining the effectiveness of the firm's behavior in responding to the environment. Figure 1 depicts our theoretical model.

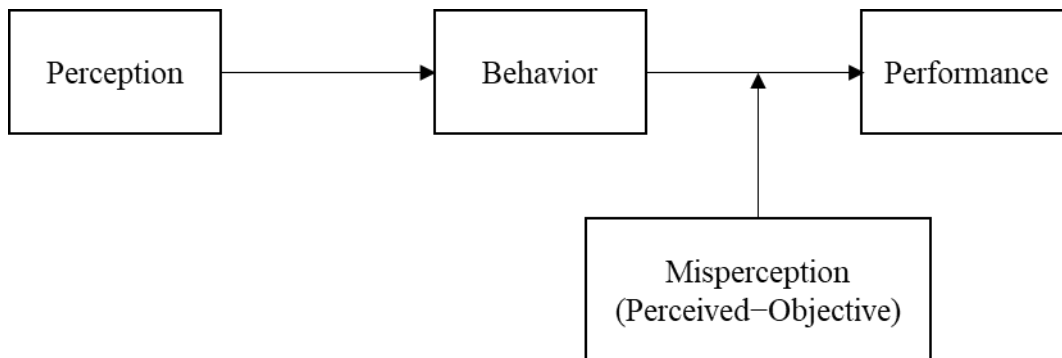


Figure 1. Conceptual model

### Hypotheses

Pursuing outside opportunities as a strategic response to perceived competition

“Competition...works to drive down the rate of return on invested capital toward the competitive floor rate of return...and firms habitually earning less than this return will eventually go out of business” (Porter, 1980: 5). Knowing this, firms strategically respond to competitive pressure so as to avoid bankruptcy. Yet, the competition firms are responding to will be based on how the focal firm *perceives* the competition to be (Cyert & March, 1963; Simon, 1947). As a result, our arguments boil down to a simple statement, which proposes that firms will respond to high

perceived competition. In this article, we argue that this will take the form of firms pursuing outside opportunities (that may reside in alternative geographic or product markets) because of the mechanisms of how perceived competition affects firms.

First, high perceived competition will present a gloomy prospect for future success in the current markets, and this will be regardless of why the focal firm is perceiving high competition. For example, firms may perceive high competition because competitors are aggressively engaging in competitive actions in the market. In such an environment, the focal firm will have to actively respond to the competitive pressure to defend their market position, where even doing so may not guarantee success in the market (Ferrier, Smith, & Grimm, 1999). Firms may also perceive the surrounding environment to be highly competitive when they lack the resources and capabilities that may grant them competitive advantage (Barney, 1991). Without such resources, it will be natural that those firms will anticipate less positive outcomes in the current markets. Overall, such circumstances due to high perceived competition will present the focal firm's current markets as less desirable to continue to reside in. As a result, firms may look for ways to avoid the high perceived competition (Hombert & Matray, 2018; Ljubownikow & Ang, 2020), which may be done by looking for opportunities outside the current markets.

Second, when facing high perceived competition, firms will expect their profits to decrease in their current markets (Jacobsen, 1988; Mueller, 1986; Roberts, 1999). This may be due to various reasons resulting from competition, such as pressure to reduce prices, difficulty in acquiring the necessary resources, erosion of the current customer base, etc. Whatever the cause, expectations of a profits decrease will increasingly make firms become aware of a situation where the deployment of their current resources and capabilities may not be effective in

generating returns in the current markets (Helfat & Eisenhardt, 2004; Matsusaka, 2001). If so, firms will consider alternative ways to utilize their resources and capabilities that will be more likely to result in higher returns compared to the current competitive markets. This may be achieved by pursuing outside opportunities (Ref & Shapira, 2017), which may present better ways to effectively use the firm's assets in generating profits.

Based on such reasons, it becomes a rational response for firms to pursue outside opportunities when they are perceiving high competition. Indeed, related studies lend support to our argument. For example, in the international business (IB) literature, many studies have examined how fierce competition in the domestic market push domestic firms to go abroad for alternative opportunities (Cuervo-Cazurra, Luo, Ramamurti, & Ang, 2018; Hennart & Park, 1994; Ito, 1997; Ito & Pucik, 1993; Mascarenhas, 1986). Outside opportunities may apply to not only geographic markets but also product markets. Relatedly, studies have shown how firms may pursue alternative product markets by investing in innovation (Hombert & Matray, 2018; McCann & Bahl, 2017) or pursuing unrelated diversification (Ljubownikow & Ang, 2020) when facing high product market competition. Finally, the 'blue ocean strategy' delivers a similar message where it emphasizes that "the only way to beat the competition is to stop *trying* to beat the competition" (Kim & Mauborgne, 2005: 4). In other words, it can be important to search for outside market spaces when perceiving high competition.

*Hypothesis 1 (H1): Perceived competition is positively associated with firms' endeavor to pursue outside opportunities.*

Performance implications of pursuing outside opportunities when facing competition

As we have articulated above, the relationship between perceived competition and firms' endeavor to pursue outside opportunities has been sporadically examined in the literature with some empirical evidence (Hombert & Matray, 2018; Ito & Pucik, 1993; Liubownikow & Ang, 2020). However, past studies have less examined whether such actions lead to enhanced performance, which leaves us with an incomplete understanding of the effectiveness of pursuing outside opportunities as a strategic response to perceived competition. With our mediating model, we argue that it is indeed the case for the following reasons.

First, perceived competition will push the firm to enhance the competitiveness of their products and services to survive the fierce competition, which will strengthen the likelihood of their success when pursuing outside opportunities. This may take the form of firms increasing their productivity (Galdon-Sanchez & Schmitz, 2002; Schmitz, 2005) that may be achieved through greater specialization and managerial inputs (Backus, 2020). Alternatively, firms may push for innovative products that may give them a competitive edge outside their current markets. Such initiatives will increase the competitiveness of the focal firm, which will enable the firm to perform better in different geographic or product markets. In a similar sense, Sakakibara & Porter (2001) show how fierce domestic competition within the Japanese market pressured Japanese firms to innovate and upgrade their productivity, which led to their international competitiveness and ultimately higher international performance.

Second, pursuing outside opportunities may help mitigate the perceived competitive pressure in the current markets while opening new potential for success. By avoiding fierce competition, the focal firm may be able to expand and increase sales in different markets that would have been difficult to achieve in their current markets. Performance enhancement may

also take place with outside opportunities presenting better ways to utilize firms' current resources and capabilities (Helfat & Eisenhardt, 2004; Matsusaka, 2001; Ref & Shapira, 2017) that may not have been effective in creating competitive advantage in the current markets. Such redeployment of the resources may result in relatively higher returns compared to the current utilization in competitive markets thereby leading to higher performance.

Nevertheless, we expect firms' endeavor to pursue outside opportunities to partially mediate the relationship between perceived competition and firm performance. This is because it is difficult to imagine how firm performance will be determined irrelevant to the focal firm's actions within the market that is perceived to be highly competitive. Indeed, as argued above, high perceived competition will push firms to increase productivity that may enable them to compete better in their current markets (Backus, 2020). However, perceived competition may also motivate firms to engage in other strategic behaviors such as non-market strategies (Iriyama et al., 2016) and launching attacks on competitors (Chen et al., 2007; Tsai et al., 2011) that may lead to enhanced firm performance in the current markets, which may not be necessarily related to firms' pursuit of outside opportunities.

*Hypothesis 2 (H2): Firms' endeavor to pursue outside opportunities partially mediates the association between perceived competition and firm performance.*

Role of competition gap (perceived – objective competition) on firm performance

Thus far, we have mainly focused on the behavioral and the resulting performance implications of perceived competition. However, while performance will be affected by firms' response to perceived competition, there needs to be an examination of how accurate their perceptions are, to fully understand the performance implications of firm behavior. Therefore, we investigate how

the misperception of the competition (i.e., competition gap, represented by the difference between the perceived and objective) may affect firm performance. Specifically, we propose that misperceiving the competitive environment by viewing it more negatively than the objective reality may help the focal firm achieve better performance by increasing the effectiveness of pursuing outside opportunities in the face of perceived competition.

First, while perceived competition is likely to push the focal firm to innovate and enhance their productivity thereby increasing their chances of success in outside markets (Sakakibara & Porter, 2001), this effect will be more significant when the firm is overestimating their surrounding competition. Ex ante, such firms would not realize their endeavors of upgrading the competitiveness of their products may be more than enough in dealing with the surrounding objective competition. However, by having gone excessive lengths, their products will have become much more competitive than it would have been if the focal firm was perceiving the competition as not so serious. While this may be more than enough in dealing with the perceived competition in current markets, such efforts would further strengthen their competitiveness in outside markets, making it more likely for them to succeed. At the same time, with their enhanced products, the focal firm will have a less difficult time competing in outside markets with the competitors from the current markets, if those competitors were to have presence in the same outside markets as well.

Second, when pursuing outside opportunities, firms with a larger competition gap will have engaged in more aggressive strategic actions when pursuing outside opportunities. In outside geographic markets, this may take the form of strengthening ties with the local stakeholders (Reimann, Ehr Gott, Kaufmann, & Carter, 2012; Rong, Wu, Shi, & Guo, 2015) or

implementing localized strategies (Arregle, Beamish, & Hébert, 2009). With outside product markets, investment in innovation (Roberts, 1999) or marketing can be examples. Because of their misperception, these actions may have been more than sufficient in mitigating the pressure from perceived competition in the current markets. However, with such actions, such firms will likely enhance their chances of succeeding in outside markets. Overall, while such excessive actions resulting from the competition gap may have been while effective but inefficient if they were intended to deal with the current perceived competition, we argue that the misperception may have unintended beneficial consequences in outside markets.

*Hypothesis 3 (H3): Competition gap positively moderates (i.e., strengthens) the association between firms' endeavor to pursue outside opportunities and firm performance.*

## Methodology

### Data and sample

In testing our hypotheses, the current study utilizes the II–IV panel dataset of the Business Environment and Enterprise Performance Surveys (BEEPS). The survey was conducted by the World Bank Group and the European Bank for Reconstruction and Development (EBRD), which covers countries in Eastern Europe and Central Asia. The BEEPS survey has been actively used in prior studies in the management literature (Krammer, 2019; Lee & Weng, 2013; McCann & Bahl, 2017). The objective of the survey was to receive feedback from firms in EBRD countries of operation on the state of the private sector as well as to track changes of environmental surroundings of the businesses over time (European Bank for Reconstruction and Development, 2013). Specifically, the survey covers extensive subjects including infrastructures, sales,



innovation, inspections, government relations as well as the perceived competitive pressure, which makes the BEEPS dataset an ideal dataset for testing our hypotheses.

Respondents to the survey are mostly business owners or top managers of the firm, who would have the most information and knowledge of the firm. In order to obtain unbiased estimates for subgroups of the population, three levels of stratification were used in each country, which are industry, establishment size, and region. As an endeavor to build a panel data, the survey administered approximately 6,500 firms in 27 countries in 2002, 9,500 firms in 28 countries in 2005, and 12,000 firms in 29 countries in 2008-2009. While the raw dataset consists of 27,241 firm-year observations, the final sample of the current study is 8,353 firm-year observations from 27 countries after dropping missing observations.

Firm performance (Dependent variable)

Measuring performance of firms in transition economies may be challenging because business owners often times do not have a clear boundary between their business and personal assets. They may also have “incentives to underreport their profits as a means of evading taxes” (Assenova & Sorenson, 2017: 809). Most importantly, the survey does not ask the respondents for information regarding the profitability of their business, which makes it difficult to capture performance measures such as ROA. Therefore, we operationalize *firm performance* by using the logged value of total sales, which has been commonly used in prior studies (Assenova & Sorenson, 2017; Giorcelli, 2019; Tang, Tang, Marino, Zhang, & Li, 2008).

Pursuit of outside opportunities (Mediator variable)

We use firms' *export intensity* as our measure to capture firms' endeavor to pursue outside opportunities. Firms export to expand their markets beyond the domestic market, which well

represents our theoretical construct of pursuing outside opportunities. Export intensity is the ratio of a firm's direct export over total sales (Filatotchev, Dyomina, Wright, & Buck, 2011; Kiss, Fernhaber, & McDougall–Covin, 2018; Lee & Weng, 2013; Lu & Beamish, 2001). The measure was obtained by asking respondents “what percent of this establishment's sales were direct exports?” and ranges from 0 to 100.

#### Perceived competition (Independent variable)

The degree of *perceived competition* is captured by asking the respondents of their perceived competitive threat in the domestic market. Therefore, we included all the firms that compete within each domestic markets including foreign subsidiaries that may be after the same customer base with the focal firm. We use four question items to measure perceived competition.

Specifically, the items ask respondents to rate the importance of pressure from domestic competitors in affecting decisions “to develop new products or services and markets” and “with respect to reducing the production costs of existing products or services” on a four-point Likert scale (1 = not at all important, 4 = very important). The same questions were asked for the pressure coming from foreign competitors. We therefore operationalize perceived competition by calculating the average value of the four question items, which represents our measure of perceived competition within the domestic market.

#### Competition gap (Moderator variable)

We measure *competition gap* as the difference between the perceived competition and the objective competition. Perceived competition we have explained above. In measuring objective competition, we utilize the actual rivalry construct of Cool et al. (1999), where actual rivalry is essentially an adjusted Herfindahl index that is computed as the total market Herfindahl minus

the market share (squared) of the focal firm (Lee, Mun, & Park, 2015). While it has its limitation in representing the entire population of firms, the BEEPS survey collected sales information of 19,524 firms in 22 industries in 27 countries, which enables us to calculate a focal firm's proximate market share in a given industry-country-year. Our objective competition measure represents competitive pressure that is based on objective market share, which may be different from the perceived competition of the focal firm. If the focal firm *perceives* the competition in the market is higher than it actually is, the competition gap is greater for the firm.

Our resulting perceived competition and objective competition variables are based on different scales. Therefore, we follow the approach of Busenbark, Marshall, Miller, & Pfarrer (2019), by standardizing the two variables to compute the difference between the standardized perceived competition and standardized objective competition, which becomes our competition gap variable.

It is important to note that our variables *perceived competition* and *competition gap* are highly correlated ( $r = 0.73$ ), which may cause concerns of multicollinearity. In order to address this issue, we orthogonalized the two variables (in the order of perceived competition and competition gap) to create a new set of uncorrelated variables by using the `orthog` command in Stata 16 (Greve & Seidel, 2015; Bermiss, Hallen, McDonald, & Pahnke, 2017). Through orthogonalization, "each coefficient expresses the effect of its variable after removing the effects of the preceding variable(s). Thus, it is not necessary to consider the correlations of the variables when assessing the effect of each one" (Greve & Seidel, 2015: 485). While we include the orthogonalized variables when running our empirical models, we present the unorthogonalized value of the variables in our descriptive statistics.

## Control variables

We include a number of controls in our study that are expected to influence firms' export intensity and ultimately firm performance. Firm age and size may affect export behavior of firms (D'Angelo & Buck, 2019; Ito, 1997; Shinkle & Kriauciunas, 2010). Therefore, we control for both *firm age* by including the logged value of firm age and *firm size* by including a categorical variable, where 1 = fewer than 20 employees, 2 = 20~99 employees, and 3 = over 99 employees (Lee and Weng, 2013). In addition, ownership structure of the firm has been shown to be relevant in influencing firms' motivation and capabilities in going abroad (Filatotchev et al., 2001; George, Wiklund, & Zahra, 2005; Oesterle, Richta, & Fisch, 2013). We include *foreign ownership* and *state ownership*, which are dummy variables that hold the value of 1 if the foreign and state ownership of the firm is over 50%, respectively.

Government subsidies may encourage firms to seek opportunities abroad by enabling the firm to cut costs or invest in innovation thereby making their products more competitive in the international market (Nuruzzaman, Singh, & Gaur, 2020; Yuan, Qian, & Pangarkar, 2016). In order to control for such effects, we include a dummy variable *subsidies*, which holds the value of 1 if the firm has received subsidies from national, regional or local governments over the last three years, and 0 if otherwise. We also control for *capacity utilization*, which was captured by the item "what was this establishment's output produced as a proportion of the maximum output possible if using all facilities available?" Following previous literatures, we use the variable *capacity utilization* to account for firm slack (Ayyagari, Demirgüç-Kunt, & Maksimovic, 2014), given that export behavior may be dependent on the firm's level of slack (Kiss et al., 2018; Paeleman, Fuss, & Vanacker, 2017).

Firms that establish a strong market presence within the domestic market through nonmarket strategies such as bribery may have less motivation to venture abroad (Lee & Weng, 2013). To take this into account, we control for *bribery* by utilizing an item that asks respondents the percent of total annual sales paid as informal payment to “get things done”. Innovative efforts may enable firms to convert their tangible and intangible resources into sources of competitive advantage thereby enhancing their likelihood of success in foreign markets (Filatotchev & Piesse, 2009; Fors & Svensson, 2002; Lin & Wang, 2021; Purkayastha, Manolova, & Edelman, 2018). We therefore include *new product*, which is a dummy variable that holds the value of 1 if the firm had introduced new products or services in the last three years, and 0 if otherwise.

Relationships with the government in transition economies may also be important when going abroad. Therefore, we include *government contract*, which is a dummy variable that holds the value of 1 if the firm secured or attempted to secure a government contract over the last year, and 0 if otherwise. We also control for *government regulation*, which is captured by the item, “in a typical week over the last year, what percentage of total senior management's time was spent on dealing with requirements imposed by government regulations?”

Institutional environment surrounding the firm may either aid or restrain the firm’s endeavors in seeking outside opportunities (Cui & Jiang, 2012; Gaur, Ma, & Ding, 2018; Witt & Lewin, 2007). We therefore include four variables that represent relevant institutional factors in influencing export activities of the firm. The variables are (1) *tax rates as obstacle*, (2) *labor regulations as obstacle*, (3) *access to finance as obstacle*, and (4) *inadequately educated workforce as obstacle*. The variables are obtained by asking respondents the questions, “Is ~ no obstacle, a minor obstacle, a moderate obstacle, a major obstacle, or a very severe obstacle to the

current operations of this establishment?” on a five-point Likert scale (0 = No obstacle, 4 = Very severe obstacle). Finally, industry, country, and year dummies are included in the models.

### Analysis

To test our conceptual model, we conduct several empirical models. For H1, we conduct a panel OLS model. To test the mediation relationship of H2, we use the generalized structural equation model with bootstrapping (Aguinis, Edwards, & Bradley, 2016). To test H3, we conduct a moderated mediation analysis using generalized structural equation modeling with bootstrapping (Hayes, 2013; Preacher, Rucker, & Hayes, 2007). We examine whether a moderated mediation exists by testing if the indirect effect is conditionally influenced by the moderator variable. If the conditional indirect effects are statistically different at different values of the moderator variable, we may argue for a moderated mediation relationship.

### Results

We present the descriptive statistics including means, standard deviations, and correlation coefficients for our variables in Table 1. The correlation among our study variables does not appear to be problematic and the mean variance inflation factor (VIF) score for all variables is 1.31, which is below the recommended threshold of 10. The highest VIF value for each variable is 2.30, providing further evidence that multicollinearity is not a major concern in the study. However, we do find that *firm size* is highly correlated with *firm performance* ( $r = 0.69$ ), which is because larger firms are more likely to have higher sales volume. The results remain qualitatively the same if we remove *firm size* from the model.

Table 1. Means, standard deviations, and correlation among variables

Variable	1	2	3	4	5	6	7
1 Firm performance	1.00						
2 Export intensity	0.26	1.00					
3 Perceived competition	0.18	0.11	1.00				
4 Competition gap	0.04	0.00	0.73	1.00			
5 Firm age	0.37	0.08	0.03	0.04	1.00		
6 Firm size	0.69	0.28	0.05	0.10	0.38	1.00	
7 Foreign ownership	0.11	0.20	0.03	0.07	-0.07	0.15	1.00
8 State ownership	0.10	-0.01	-0.14	0.06	0.27	0.24	0.11
9 Subsidies	0.20	0.07	0.01	0.01	0.17	0.17	-0.03
10 Capacity utilization	0.01	-0.00	-0.04	0.01	-0.07	-0.01	0.02
11 New product	0.14	0.10	0.10	0.09	0.01	0.14	0.06
12 Bribery	-0.06	-0.05	0.01	-0.01	-0.08	-0.07	-0.00
13 Government contract	0.00	-0.02	0.10	0.05	-0.07	-0.04	-0.01
14 Government regulation	0.06	-0.00	-0.00	-0.00	0.02	0.07	0.05
15 Tax as obstacle	-0.00	-0.02	0.20	0.18	-0.01	-0.03	-0.02
16 Labor regulation as obstacle	0.16	0.06	0.22	0.18	0.05	0.06	0.00
17 Finance as obstacle	-0.04	-0.03	0.15	0.12	0.01	-0.07	-0.07
18 Workforce as obstacle	0.15	0.04	0.13	0.11	0.03	0.08	0.01
Mean	12.87	9.51	2.44	0.06	2.49	1.70	0.12
Standard Deviation	2.15	23.18	0.82	1.38	0.73	0.78	0.33

Variable	8	9	10	11	12	13	14
8 State ownership	1.00						
9 Subsidies	0.18	1.00					
10 Capacity utilization	-0.04	-0.01	1.00				
11 New product	-0.01	0.02	-0.04	1.00			
12 Bribery	-0.04	-0.05	-0.08	0.06	1.00		
13 Government contract	-0.06	-0.02	-0.07	0.05	0.33	1.00	
14 Government regulation	0.09	0.03	-0.05	0.06	0.16	0.10	1.00
15 Tax as obstacle	-0.07	-0.01	-0.07	0.04	0.11	0.13	0.07
16 Labor regulation as obstacle	-0.05	0.06	-0.01	0.05	0.04	0.11	0.04
17 Finance as obstacle	-0.00	0.00	-0.09	0.02	0.09	0.09	0.07
18 Workforce as obstacle	-0.02	0.04	-0.08	0.10	0.09	0.14	0.06
Mean	0.13	0.08	80.45	0.37	1.38	0.26	6.54
Standard Deviation	0.34	0.28	20.23	0.48	3.04	0.44	11.14

Variable	15	16	17	18
15 Tax as obstacle	1.00			
16 Labor regulation as obstacle	0.34	1.00		
17 Finance as obstacle	0.32	0.20	1.00	
18 Workforce as obstacle	0.24	0.42	0.19	1.00
Mean	1.81	0.88	1.35	1.04
Standard Deviation	1.11	0.99	1.16	1.08

Note: n=8,353, Correlations  $\geq |0.025|$  are significant at the  $p < 0.05$  level.

Table 2 reports the results of the panel OLS regression that tests for H1, which argues that increasing perceived competition will motivate firms to look for outside opportunities by engaging in more export activities. Thus, there will be a positive association between perceived competition and export intensity. We find strong support for H1, where in Model 2, the coefficient of perceived competition is positive and significant ( $\beta = 0.698, p < 0.01$ ).

Table 2. Panel OLS regression model

DV: Export	Model 1	Model 2
Perceived competition		0.698** (0.249)
Firm age	-0.229 (0.368)	-0.223 (0.368)
Firm size	6.714*** (0.349)	6.652*** (0.350)
Foreign ownership	10.90*** (0.720)	10.79*** (0.721)
State ownership	-5.133*** (0.762)	-4.962*** (0.764)
Subsidies	1.237 (0.825)	1.298 (0.825)
Capacity utilization	-0.006 (0.0112)	-0.005 (0.011)
New product	1.526*** (0.473)	1.420** (0.474)
Bribery	-0.132† (0.078)	-0.133† (0.078)
Government contract	-0.362 (0.540)	-0.442 (0.540)
Government regulation	0.011 (0.020)	0.011 (0.020)
Tax as obstacle	-0.629** (0.228)	-0.690** (0.229)
Labor regulation as obstacle	0.478† (0.263)	0.432 (0.263)
Finance as obstacle	0.136 (0.207)	0.083 (0.208)
Work force as obstacle	0.235 (0.235)	0.225 (0.235)
Constant	11.64***	11.81***



Table 2, continued

	(2.373)	(2.373)
Industry dummies	Included	Included
Country dummies	Included	Included
Year dummies	Included	Included
R-squared	0.200	0.202
Observations	8,353	8,353

Standard errors in parentheses,

†  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Table 3 reports the results of the bootstrapping mediation regression analysis that tests for H2, which argued that export intensity will partially mediate the relationship between perceived competition and firm performance. When examining the mediation effect, we bootstrapped the sample 1,000 times. The results of the bootstrapping mediation regression analysis show that the indirect effect of perceived competition is positive and statistically significant ( $\beta = 0.003$ ,  $p < 0.01$ ). In addition, the test of the direct effects showed that perceived competition had a positive association with firm performance ( $\beta = 0.071$ ,  $p < 0.001$ ) that was not mediated by export intensity. Thus, H2 is strongly supported.

Table 3. Bootstrapping mediation regression analysis

IVs	DV: Firm performance			
	Boot estimate	Boot SE	95% CI	
			Lower	Upper
<i>Indirect effect mediated by export</i>				
Perceived competition	0.003	0.001	0.001	0.005
<i>Direct effects</i>				
Perceived competition	0.071	0.013	0.044	0.097
Export intensity	0.004	0.001	0.002	0.005
<i>Total effects</i>				
Perceived competition	0.074	0.013	0.047	0.100
Export intensity	0.004	0.001	0.002	0.005

Notes:  $N = 8,353$ . Generalized structural equation modeling is used. CI is confidence interval. CIs containing zero are interpreted as non-significant. Bootstrapping is based on 1,000 replications.

In H3, we proposed that competition gap will positively moderate the second-stage relationship between export intensity and firm performance. Table 4 reports the results of the generalized structural equation modeling that provides the regression coefficients that are necessary to compute the conditional indirect effects. In Model 2, the generalized structural equation modeling results shows a significant positive interaction ( $\beta = 0.001, p < 0.05$ ) between export intensity and competition gap. Table 5 reports the results of the bootstrapping moderated mediation regression analysis. When examining the moderated mediation effect, we bootstrapped the sample 1,000 times. In Table 5, when competition gap is low, the relationship between export intensity and firm performance is positive and marginally significant ( $\beta = 0.002, p < 0.1$ ). When competition gap is high, the relationship is positive and strongly significant ( $\beta = 0.004, p < 0.01$ ). The difference between low and high competition gap is marginally significant ( $\beta = -0.002, p < 0.1$ ), which provides weak support for H3.

Table 4. Generalized structural equation model

DV: Firm performance	Model 1	Model 1
Export	0.003*** (0.001)	0.003*** (0.001)
Competition gap	0.059*** (0.014)	0.049*** (0.015)
Export $\times$ Competition gap		0.001* (0.001)
Perceived competition	0.070*** (0.013)	0.071*** (0.013)
Firm age	0.155*** (0.019)	0.154*** (0.0190)
Firm size	1.753*** (0.018)	1.752*** (0.018)
Foreign ownership	0.279***	0.278***

Table 4, continued

	(0.039)	(0.039)
State ownership	0.150***	0.150***
	(0.040)	(0.040)
Subsidies	0.079†	0.079†
	(0.044)	(0.044)
Capacity utilization	0.001**	0.001**
	(0.001)	(0.001)
New product	0.131***	0.129***
	(0.025)	(0.025)
Bribery	-0.018***	-0.018***
	(0.004)	(0.004)
Government contract	0.160***	0.161***
	(0.029)	(0.029)
Government regulation	0.002*	0.002*
	(0.001)	(0.001)
Tax as obstacle	-0.031*	-0.030*
	(0.012)	(0.012)
Labor regulation as obstacle	0.023†	0.023†
	(0.014)	(0.014)
Finance as obstacle	-0.042***	-0.041***
	(0.011)	(0.011)
Work force as obstacle	0.013	0.013
	(0.012)	(0.012)
Constant	8.817***	8.820***
	(0.124)	(0.124)
Industry dummies	Included	Included
Country dummies	Included	Included
Year dummies	Included	Included
Observations	8,353	8,353

Standard errors in parentheses,

†  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ 

Table 5. Bootstrapping moderated mediation regression analysis

Level of moderator (competition gap)	DV: Firm performance			
	Boot estimate	Boot SE	95% CI	
			Lower	Upper
Low	0.002	0.000	0.000	0.005
Mean	0.003	0.000	0.001	0.005
High	0.004	0.001	0.001	0.007

*Notes:*  $N = 8,353$ . Generalized structural equation modeling is used. CIs are bias-corrected confidence intervals. CIs containing zero are interpreted as non-significant. Moderator values are mean  $\pm 1$  SD. Bootstrapping is based on 1,000 replications.

## Discussion

Our study starts by articulating how perceived and objective competition may have distinct influences on firm behavior and performance. We propose that firm behavior and performance will be mainly driven by how intense the firm perceives the surrounding competition to be. Yet, how the firm behavior affects performance will be further influenced by how accurately the firm perceives the objective competition. Based on a survey dataset, we find empirical evidence for our hypotheses, where perceived competition is associated with a firm behavior of pursuing outside opportunities, which ultimately leads to enhanced performance. Interestingly, the results reveal that misperceiving competition by believing the competition is fiercer than it actually is, may be beneficial for the firm. We believe the current study may act as a starting point for a thread of an interesting dialogue regarding how the objective reality and perceived reality of the environment may matter for the firm.

We make contributions to the literature in several ways. Our study is one of the first to distinguish perceived and objective competition to examine their behavioral as well as performance implications on firms. Perception and reality are different and therefore influence the firm in distinctive ways. Past studies have been limited in focusing on either perceived or objective competition (Cool et al., 1999; Gimeno & Woo, 1999; Iriyama et al., 2016; McCann & Bahl, 2017; Tsai et al., 2011). This is because with perceived competition, it becomes more relevant to observe firms' behavior in response while with objective competition, performance consequences become more applicable. The strength of the current study is that we examine both

perceived and objective competition, which allows us to have a comprehensive understanding to their impact on the firm.

We also shed light on firm's competition gap, which is a unique form of environmental misperception that is a relatively underexamined concept in the management literature. While the finding that misperception may be beneficial to firm performance at first glance appear counterintuitive, it points to the fact that there needs to be a fundamental understanding of what the misperception is about and how it is taking place. For example, related studies on cultural and institutional environments (Azar & Drogendijk, 2019; Weber et al., 2020) find that misperception is detrimental to the firm. This may be because firms may exert more influence on their competitive surroundings through competitive actions compared to macro environments such culture and institutions that becomes more difficult to alter. However, this may also depend on whether the firm is misperceiving the environment in a positive or negative way. Our results suggest that perceiving the environment in a positive light than it actually is may in fact result in the firm being less prepared in responding to the environmental threat.

Finally, we contribute to the competition literature by showing how firm behavior driven by competitive pressure improves firm performance. Firms may engage in various type of behaviors in the face of competition, such as diversification (Ljubownikow & Ang, 2020), innovation (Hombert & Matray, 2018; McCann & Bahl, 2017), competitive actions (Chen et al., 2007; Tsai et al., 2011) or pursuing outside opportunities (Hennart & Park, 1994; Ito, 1997; Ito & Pucik, 1993). While such actions are intended to ultimately improve firm performance as a response to competition, there is yet limited empirical evidence that such behaviors indeed are

beneficial to the firm. To do so, there will have to be careful consideration of what form of competition the focal firm is facing so that the effectiveness of the behavior may be evaluated.

We present implications for practitioners who may not be confined to the current context. The findings of the current study show that pursuing outside opportunities may be rewarding in the face of competition. However, such endeavors may not be as fruitful if the firm is not knowledgeable of outside opportunities in advance. As a result, it will be crucial for firms to continuously explore, identify, and analyze opportunities outside their current markets so that they will be prepared to enter those markets when necessary. In addition, notwithstanding such endeavors, accurately perceiving the competitive surrounding will always be challenging. If cognitive errors are bound to happen, it may be better for firms to assume the worst, rather than speculating a rosy picture of the competition. However, misperception will be beneficial ex-post, only when the firm engage in actions intended to cope with the misperceived fierce competition.

We identify limitations of this study that may be acknowledged as opportunities for future research. First, while we observe firms' endeavor to pursue outside opportunities (i.e., export intensity), we do not examine exactly where they are going (i.e., countries), which may present new research agendas. For example, in the face of perceived competition, will firms pursue outside markets that are somewhat similar to their current markets, or will they go after more distant opportunities (Dimov & De Holan, 2010)? In addition, how will such varying behaviors influence performance (De Clercq & Dimov, 2008; Klepper & Simons, 2000)? A priori, one may expect both directions, where on the one hand, firms may pursue outside opportunities with less distance so that they may face less complexities in utilizing their current resources and capabilities (Helfat & Eisenhardt, 2004; Matsusaka, 2001). On the other hand,

firms may prefer more distant opportunities with the hope that they will have minimal contact with their current competitors.

Second, we are limited to examining only one type of firm behavior in the face of perceived competition. Of course, firms may engage in other types of strategic actions in the face of perceived competition, which may also improve performance. However, we believe examining other behaviors may be important because they may distinctively highlight the role of competition gap. For example, rather than avoiding the imminent competition, firms may choose to retaliate by directly engaging with the competitors through competitive actions (Chen, 1996; Chen et al., 2007). In such a case, misperceiving competition may lead firms to over- or less-commit their resources to responding to the competition, which may be detrimental to firm performance either way. Another example may be when firms choose to acquire their competitors to mitigate competition. If the competition gap is large, the focal firm may end up paying an unnecessarily high price for the acquisition, which may ultimately dampen their performance (Krishnan, Hitt, & Park, 2007). Finally, the current measure of logged sales may not be the best option in capturing firm performance, where others such as sales growth or profitability measures may be more suitable. Nonetheless, given the current data limitations, we believe the current measure well captures the performance implications of pursuing outside opportunities, which is fundamentally intended to expand the focal firm's markets.

### Conclusion

The current paper begins by suggesting that our understanding of behavioral and performance implications of competition may be incomplete if we consider only one side of either perceived or objective competition. Indeed, the findings of the study show that while perceived competition

largely determines firms' strategic behavior and the derived performance, misperception of the objective competition can influence performance by altering the effectiveness of firm behavior. We hope our study encourages future studies to join our endeavor in having an encompassing understanding of how both the objective reality and how one perceives the reality matters in management research.

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**CHAPTER 2**  
**DOMESTIC FACTOR MARKET COMPETITION AND FIRM RISK-TAKING:  
EVIDENCE FROM THE U.S. UPSTREAM OIL AND GAS INDUSTRY**

Abstract

We explore how U.S. upstream oil and gas firms respond to domestic factor market competition centered on finite proved reserves with their investment behaviors in domestic as well as in foreign markets. Our research delivers one clear message: firms engage in investment activities that enable them to avoid direct factor market competition. Within the domestic market, we conjecture that firms facing competition will increase their investment in riskier activities in pursuit of resources. Beyond the domestic market, firms are likely to avoid competition by seeking opportunities abroad; yet, they selectively do so by entering low-risk countries in search of resources. Once they enter low-risk countries, firms further engage less in risk-taking activities. Empirical analyses testing our hypotheses corroborate our ideas.

## Introduction

Despite global collective endeavors to reduce dependence on oil and gas as energy sources, achieving this goal may take more time than anticipated. According to the BP Statistical Review of World Energy (2020), fossil fuels still provide approximately 85% of energy supplies worldwide, with increasing growth where oil consumption grew by 0.9 million barrels per day (bpd). No wonder the total amount of proved reserves increased from 1,277.1 (thousand million barrels) in 1999 to 1,531.8 in 2009, and to 1,733.9 in 2019. The U.S. has taken an active part in maintaining the era of oil and gas. Starting from 2015, the U.S. has surpassed both Russia and Saudi Arabia to become the largest oil producing country in the world, producing 1.7 million bpd in 2019. However, unlike many other countries where national oil companies control the production of oil and gas, U.S.-domiciled individual upstream oil and gas firms play a major role in oil and gas production in the U.S.

Given the increasing production of oil and gas with steady demand across the globe, one may think that the U.S. upstream oil and gas business is making easy money. However, this may not be the case for two reasons. First, even though proved reserves are increasing annually, oil and gas as natural resources are inherently finite (Hart, 1995; Karadag & Poppo, 2021). Therefore, competition for resources is naturally taking place within the domestic context (U.S.), as it is important to secure reserves ahead of competitors. For upstream oil and gas firms, securing reserves will undoubtedly be the most important activity in achieving future profit and growth. Such competition is likely to take place initially with proved reserves, as well as reserves that are predicted to be economically viable under current price and cost conditions and to have a

90% probability of successful recovery using existing technologies (U.S. Securities and Exchange Commission, 1978).

Second, in addition to competition for resources, the upstream oil and gas business is an inherently risky business, where the process of exploring and developing reserves may not always result in economically profitable operations, let alone finding proved reserves that are viable for long-term production in the first place. Even with today's seismic and evaluation techniques, the productivity of a reserve often remains unclear until actual drilling reveals the composition of the formation underground. Facing such complications, U.S. upstream oil and gas firms vary in terms of their risk-taking: some firms choose to explore and develop low-risk investments such as proved reserves, whereas other firms choose to pursue high-risk investments such as unproved reserves that are less likely to be recoverable.

Taking this information together, a natural question involves how U.S. upstream oil and gas firms respond to domestic factor market competition in terms of their risk-taking behavior. On the one hand, firms may choose to meet the competition head on by investing in more domestic proved reserves (low-risk), which are less likely to fail in delivering value to the firm. On the other hand, firms may find direct competition for low-risk resources costly because competition will make it more challenging and costly to obtain such resources. Therefore, these firms may alternatively seek high-risk investments within the domestic market to avoid direct competition while pursuing the potential high returns of high-risk resources.

However, opportunities are not confined only within the U.S. In fact, just 14.1% of proved reserves reside in North America, with the vast majority located internationally. Therefore, domestic factor market competition may in fact drive firms to seek reserves in foreign

countries. While exploring such opportunities abroad may be rewarding, international endeavors are also costly to firms (Hymer, 1976; Zaheer, 1995). For example, Devon acquired PenzEnergy and Sante Fe Snyder in 1999, with the intention of gaining access to oil producing operations in Azerbaijan, West Africa, and Brazil. This acquisition ended in failure, with Devon eventually selling its foreign assets in 2009 (Stadler, Mayer, & Hautz, 2015). Therefore, U.S. oil and gas firms approach their internationalization strategies cautiously to cope with domestic factor market competition effectively by venturing abroad.

Specifically, when firms pursue internationalization to avoid domestic factor market competition, they will not blindly venture into foreign markets. Rather, firms will likely be looking for substitutes of the domestic factor market by choosing certain host countries that present a similar favorable environment to pursue resources. More importantly, when pursuing resources in the host countries, firms must make a choice in their risk-taking activities after entering the host countries. Without understanding firms' risk-taking investments abroad, we are left with only a fragmented understanding of how firms cope with domestic factor market competition in an international setting. Therefore, our ultimate research questions are the following: How does domestic factor market competition influence firms' domestic risk-taking (DRT)? In addition, if the competition pressures firms to avoid the domestic market, where will these firms go, and how will they respond with their international risk-taking (IRT) activities?

Empirically, we leverage a unique dataset of U.S. upstream oil and gas firms, where risk-taking measures are well defined by the Financial Accounting Standards Board (Gilje, 2016). This agency classifies investments in reserves as high- or low-risk, depending on their comparative likelihood of producing oil and gas. This setting also allows us to mainly focus on

factor market competition, with less concern about product market competition (Asmussen, 2015; Chatain, 2014; Markman, Gianiodis, & Buchholtz, 2009) given its setting, where the product market is mainly determined by crude oil and natural gas prices.

Results reveal that firms facing higher domestic factor market competition increase their DRT as an attempt to secure resources while avoiding direct competition. Furthermore, when facing competition, firms seek out opportunities abroad by venturing into foreign markets and pursuing foreign resources. When doing so, firms are more likely to enter low-risk countries while choosing to pursue safer investments by engaging in less IRT in low-risk countries. This notion posits that firms are looking for substitutes of the domestic market such that their international endeavors are a consistent effort to achieve this standing by going after low-risk countries and resource acquisition methods. Overall, our results show a consistent pattern of firm behavior: firms facing domestic factor market competition will engage in domestic as well as international investment activities that enable them to avoid competitive pressure.

We endeavor to make at least three contributions through this study. First, we establish a relationship between competition and firm risk-taking. To this day, there is still limited work on how competition may affect firm risk-taking (Hoskisson, Chirico, Zyung, & Gambeta, 2017; Shinkle & McCann, 2014; Stagni, Fosfuri, & Santalo, 2021; Wang & Shaver, 2014; Weigelt & Shittu, 2016). This gap is surprising, given that competition poses a direct threat to firms (Gimeno, 1999; Porter, 1980), which may compel them to take risks as a strategic response. Our study goes above and beyond in addressing such shortfalls. It does so not only by identifying competitive pressure as an antecedent to firm risk-taking, but also by showing how there needs to

be a fundamental understanding of what meaning such competition entails for focal firms to comprehend its influence on firms' risk-taking.

Second, we explore the underexamined topic of IRT. Absent a few exceptions (Ongena, Popov, & Udell, 2013), there has been a limited focus on how firms engage in risk-taking activities abroad. While many related studies consider internationalization itself as risk-taking behavior (Berger, Ghoul, Guedhami, & Roman, 2017; Carpenter, Pollock, & Learly, 2003; Jung and Bansal, 2009; Lin, Cheng, and Liu, 2009), we acknowledge the need to differentiate IRT from internationalization itself. This is because, depending on the firm's motivation and context, internationalization may be intended as a risk-reducing behavior. For example, firms may try to diversify their risk by making investments in foreign countries, which would be based on opposite motivations (Agmon & Lessard, 1977; Hitt, Hoskisson, & Kim, 1997; Rugman, 1976).

Finally, we contribute to the factor market competition literature (Barney, 1986). With our context, where product market competition is controlled by the market price, we solely focus on factor market competition and provide evidence on how firms engage in diverse investment strategies to enhance their resource positions relative to their competitors (Capron & Chatain, 2008). The findings suggest that firms may catch two birds with one stone by strengthening the focal firm's resources while indirectly "attack(ing) the resource position of their competitors" (Capron & Chatain, 2008: 98). In addition, we add empirical evidence on how factor market competition takes place, where the literature has largely focused on more theoretical advancements (Adegbesan, 2009; Capron & Chatain, 2008; Markman et al., 2009) with advanced modeling and simulation methods (Asmussen, 2015; Chatain, 2014; Makadok & Barney, 2001; Ross, 2012).

## Theory and hypotheses

### Factor market competition

Ever since Barney's (1986) seminal work on factor markets, the management literature has come to acknowledge that competition takes place not only in the product market, but also in the factor market for valuable resources. Factors are defined as the "resources necessary to implement a strategy" (Barney, 1986: 1231). This makes it imperative for firms to secure factors so that they can pursue their strategy and ultimately produce products to make profits. Therefore, it is reasonable to argue that firms will not succeed in product market competition if they fail to perform well in factor market competition. In other words, examining factor market competition is as equally important as product market competition in understanding how firms may achieve competitive advantage over their competitors.

Initial work on factor market competition has focused on how firms may gain and sustain competitive advantage, focusing on resources in a firm via an accurate expectation of factors (Barney, 1986; Makadok & Barney, 2001), accumulating factors within the firm (Diericks & Cool, 1989) or being equipped with complementary capabilities in creating value with these resources (Adegbesan, 2009). Building on this work, later studies have shifted toward examining external factor market competition, with more of a focus on competitors' actions in factor markets (Asmussen, 2015; Capron & Chatain, 2008; Klueter, Sigler, & Anand, 2021; Markman et al., 2009). According to these studies, firms may create competitive advantage by dismantling the resource position of competitors, thereby establishing a stronger position within the factor market (Capron & Chatain, 2008; Markman et al., 2009). Such strategies may become more relevant in factor markets where resources are finite (Karadag & Poppo, 2021), non-scalable

(Asmussen, 2015), versatile, and mobile (Markman et al., 2009). Our study intends to build on the latter body of literature by focusing on the implications of factor market competition.

Specifically, previous studies have paid less attention to how firms may strategically avoid fierce factor market competition as opposed to directly competing in factor markets (Capron & Chatain, 2008; Markman et al., 2009). Firms may consider two ways of avoiding factor market competition: (1) taking risk by investing in riskier resources and (2) searching for substitute factor markets that are comparable to their main factor market. First, in the face of fierce factor market competition, firms may avoid such pressure by pursuing risky resources with less competition, as firms may find risky resources less appealing due to the risk discount (Dasgupta & Maskin, 2005; Fama, 1977). However, pursuing such resources may in fact enable the firm to strengthen its resource profile while avoiding intense factor market competition for low-risk resources. This is especially the case when low-risk resources are too costly to acquire. For example, universities compete for qualified candidates in the academic job market. If the competition for advanced professors with strong records is too high, universities may go after rookies, who may be comparatively riskier but have potential while being less costly.

Second, firms may choose to avoid fierce factor market competition by pursuing resources in substitute factor markets: as with product markets, there may exist alternative factor markets available to firms. For example, European car manufacturers seeking to go electric are finding it a challenge to secure lithium, which is essential when producing batteries. To avoid fierce competition, such firms seek lithium from multiple sources, even working with local resource firms to start extracting lithium from European countries (Wissenback, 2021). Similarly, with recent advancements in technology, demand for software developers have



skyrocketed, making it difficult for U.S. tech firms to hire qualified developers. As a result, to avoid competition and economize labor costs, many firms are willing to look for alternative labor markets by hiring globally and casting their net wider than universities (Whitney, 2022). Such a tendency to avoid factor market competition (as noted above) may be more significant in industries where product market commonality is high (Chen, 1996; Markman et al., 2008). The upstream oil and gas industry is a good example of firms facing a common product market by producing homogenous crude oil and natural gas products.

It is also important to note that the concept of factor market competition has mainly focused on the domestic market context. This is surprising, given that firms actively seek resources in foreign countries, where each country is endowed with different resources. Indeed, the idea that firms go abroad for resources is not new in the international business literature; Dunning's (2000) eclectic paradigm suggests 'resource-seeking' as one of the four main types of foreign direct investment. Yet, only recently have studies begun to apply the factor market concept within an international setting by showing how the factor market environments of foreign host countries may be a motivating factor for firm entry into these host countries (Hoskisson, Wright, Filatotchev, & Peng, 2013; Kim, Hoskisson, & Lee, 2015). However, there is still little consideration for how factor market competition itself may influence firms' entry into host countries, along with their activities in foreign factor markets.

U.S. upstream oil and gas industry

In addressing the proposed research question of the study, we examine the context of the U.S. upstream oil and gas industry. When observed in detail, the oil and gas industry may be categorized into upstream, midstream, and downstream sectors, depending on the types of

operations involved in the production of oil and gas-related products. Firms in the upstream sector specialize in exploring and drilling reserves to produce crude oil and gas, whereas midstream firms are generally involved in storage and transportation-related activities. At the same time, downstream sector firms engage in the refining, processing, marketing, and distribution of oil and gas products. While each sector may differ in terms of the involved risks, we selectively focus on the upstream sector (1) because it best represents a context in which firms are facing factor market competition and (2) because of its comparative feasibility in observing and comparing firms' risk-taking behavior.

To produce crude oil and gas, upstream firms make investments in (1) drilling and (2) reserve acquisition activities, which are embedded with differing risk levels. Specifically, for drilling activities, upstream firms may choose to drill different types of wells, namely exploratory or development wells, which differ in terms of whether they are productive with regard to oil and gas. This classification is well-defined by the Financial Accounting Standards Board. Specifically, drilling exploratory wells may be considered a high-risk activity: although the likelihood of failing to produce oil and gas is high, when successful, such drilling may result in multiple potential development wells or proved reserves, which a firm may either choose to develop or sell to other firms. Development drilling activities, on the other hand, generally involve drilling proved reserves. Relatedly, Gilje (2016) finds that, on average, an exploratory well (high-risk) is nearly six times more likely to be unsuccessful than a development well (low-risk) in producing oil or gas. However, 13% of exploratory wells provided "at least 10 times their investment in exploratory wells in the form of proved reserves" (Gilje, 2016: 2932). These findings clearly suggest that drilling exploratory wells is significantly riskier, and the chances of

reaping high rewards is quite small. At the same time, however, when successful, the rewards can be exceptionally large compared to development wells.

Relatedly, upstream firms make investments in purchasing reserves that they expect to recover in producing oil and gas. As with wells, some reserves are classified as proved reserves while others are unproved reserves, depending on their likelihood of containing accumulated producible oil or gas. As a result, acquiring proved reserves may be considered low-risk compared to unproved reserves when considering the expected outcomes of developing these respective reserves. These drilling and reserve acquisition activities may of course take place in domestic as well as foreign countries. Yet, one thing to notice is that from a focal firm's perspective, other firms' drilling and reserve acquisition activities are likely to be perceived as a competitive threat. For oil and gas firms, proved reserves are firms' most valuable assets. Because such reserves are finite in nature (Karadag & Poppo, 2021), other firms' investment in proved reserves may simultaneously limit the focal firm's growth potential.

#### Relationship between domestic factor market competition and DRT

To understand the relationship between competition and firm risk-taking, there first needs to be an understanding of competition itself. In the current study, we focus on a specific form of competition, namely domestic factor market competition. When responding to domestic competition, firms are likely to start by identifying solutions within (but not necessarily confined to) the domestic country. According to March (1994: 28), "if sales fall in Texas, then they look for the problem and the solution in Texas." This is because localized competition may lead firms to focus more on the region (Baum & Lant, 2003; Porac, Thomas, & Baden-Fuller, 1989; Pouders & St. John, 1996). Perhaps more importantly, the requirements for organizational resources are

similar for competitors (Baum & Mezias, 1992). This will be more evident in the case of factor market competition, where firms pursue the same set of resources and where competitors' acquisition of domestic resources will limit the focal firm's chances of securing them.

When facing domestic competition in the factor market, firms have two sets of options in the domestic country regarding their quest for securing resources. First, they may directly compete for domestic resources, which is the most straightforward way of obtaining resources in the face of domestic factor market competition. By doing so, firms may be able to preempt resources ahead of their competitors if they are successful (Capron & Chatain, 2008). However, this method is costly for a firm because competition will likely drive up the domestic resources' prices, making it difficult for the firm to benefit from above-normal economic performance (Barney, 1986) or scarcity rents (Capron & Chatain, 2008), even if the firm does succeed in acquiring these resources. At the extreme, the market may reach near perfect market competition, where "a resource will obtain equal returns in all possible uses" (Stigler, 1957: 13). This is especially the case in industries where the product price is inelastic, such as the oil and gas industry, which will dissipate potential rents for resource holders, thereby resulting in only normal rates (Allen, Schepker, & Chadwick, 2021; Peteraf, 1993). In such a scenario, analyses and expectations of the domestic factor values may be less effective in generating value for the focal firm (Barney, 1986; Makadok & Barney, 2001).

If this is the case, firms have a second way of pursuing domestic resources that are comparatively riskier, thereby avoiding direct competition in the domestic factor market. Such resources may be considered risky and less likely to provide value to the firm compared to resources against which most firms are competing due to their high downside risk. Nonetheless,

such resources may also carry upside potential, thus enabling the focal firm to avoid direct competition while at the same time potentially acquiring the necessary resources (Leiblein, Chen, & Posen, 2017). In the oil and gas industry, firms may pursue domestic unproved reserves over proved reserves: unproved reserves may become comparatively attractive in the face of heightened competition from proved reserves. At the same time, unproved reserves may result in higher returns (Gilje, 2016). Domestic unproved reserves may be riskier. However, if the firm successfully produces oil and gas after development, the proportionate return value of the investment will be much greater than that of proved reserves. This is the fundamental reason of taking risk in the first place.

*Hypothesis 1: There will be a positive association between domestic factor market competition and DRT.*

#### Relationship between domestic factor market competition and internationalization

The first natural strategic response to domestic factor market competition would be to engage in action within the domestic market (such as DRT), as we have articulated above. However, firms' set of strategic options are not confined within the domestic market, especially in the current era of globalization. Firms may in fact look for alternative opportunities abroad when domestic market conditions are seen as unfavorable for the firm. Indeed, many studies have shown how firms pursue 'internationalization as an escape strategy' to avoid adverse domestic market environments (Gaur, Ma, & Ding, 2018; Le & Zak, 2006; Vernon, 1998; Witt & Lewin, 2007).

An equally important domestic market contingency driving firms outward is domestic competition (Cuervo-Cazurra, Luo, Ramamurti, & Ang, 2018; Wu & Deng, 2020). Relevant studies such as Ito (1997) show how medium-sized Japanese firms exported more because they were facing the most competitive pressure in the domestic market relative to their large and

small-sized peers. Relatedly, Hennart, and Park (1994), Ito and Pucik (1993), and Mascarenhas (1986) also examine how nondominant firms tend to pursue internationalization to avoid pressure from dominant domestic competitors. These studies point out that firms may pursue internationalization as an escape strategy when facing fierce competition in the domestic market. While the above studies focus on product market competition, the proposed mechanism is likely to be more evident with factor market competition. The factors are generally limited in quantity (Karadag & Poppo, 2021), and competitors' factor acquisition may limit the focal firm's access to them (Capron & Chatain, 2008). If this is the case, domestic factor market competition will likely encourage firms to look outward in search of alternative options for resources.

It is important, however, to acknowledge that firms will not mindlessly venture abroad when escaping domestic factor market competition. It is more likely the case that firms will choose to enter countries with a certain level of risk when going abroad. This idea of directional internationalization is well-established in the literature, where features of the host countries such as psychic distance (Johanson & Vahlne, 1977), institutional development (Lu, Liu, Wright, & Filatotchev, 2018), and resource-richness (Kim et al., 2015) may become relevant to a firm's choice of entering a host country. Following this line of logic, we conjecture that firms will pursue internationalization by showing a stronger tendency to enter low-risk (i.e., low costs of doing business) countries in their attempts to avoid domestic factor market competition. At the same time, these firms will find substitutes for the domestic factor market (U.S.), which is the most developed economy in the world, with little risk at the country level.

The main reason for firms to go abroad and flee from domestic factor market competition is to search for alternative options for resources. Therefore, it would be reasonable to argue that

firms will seek out countries where the process of searching and developing resources would be less complex, as with the domestic factor market. We expect such countries to be low-risk in nature. Low-risk countries are characterized as having more established institutional environments with better property rights protection and business infrastructures (Chan, Isobe, & Makino, 2008; Delios & Beamish, 1999), which are critical aspects that will facilitate the process of obtaining resources (Getachew & Beamish, 2021). As a result, firms will be more likely to become successful at acquiring resources in low-risk countries, making such countries an attractive target for firms seeking outside options for resources.

Using the same logic, high-risk countries will be less appealing because the search and development process for resources may be restricted by complications such as government regulations, a weaker infrastructure, etc. These obstacles make the quest for resources a much more difficult one. This may especially be the case in factor markets such as the oil and gas industry, where many countries consider fossil fuels as a subject of resource nationalism. In such countries, local stakeholders may have xenophobic feelings toward foreign firms based on the perception that foreign firms are ‘stealing’ from the country (Mahdavi, 2014). Indeed, we have historically witnessed countries such as Mexico, Brazil, and Venezuela nationalize their oil properties by expropriating the assets of foreign firms (Llana & Eulich, 2012).

*Hypothesis 2: There will be a positive association between domestic factor market competition and the likelihood of firms entering low-risk countries.*

Relationship between domestic factor market competition and IRT

Firms’ international strategies in response to domestic factor market competition are not likely to be confined to internationalization itself. This is because firms must still engage in investment activities within the host countries to actually search for and develop resources. Therefore,

building on our conjecture of internationalization, we take one step further by examining firms' IRT activities within low-risk countries in pursuit of resources.

We believe that firms facing fierce domestic factor market competition will reduce their IRT in low-risk countries by going after safer resources. This is because firms are likely to pursue low-risk factors first: firms pursue riskier factors when the competition for low-risk factors increases. In other words, once the firm has successfully avoided domestic factor market competition, there is little reason for it to pursue risky resources that are less likely to provide value to the firm in foreign markets. In addition, these firms go abroad to look for substitute factor markets due to the difficulty in obtaining safer resources within the domestic market because of competition. In general, internationalization itself is a risky endeavor for the firm (Hymer, 1976; Zaheer, 1995), which may partially explain our logic behind H2. If this is the case, firms would be reluctant to pursue risky activities within host countries (i.e., developing risky resources), which are already perceived as a risky environment compared to the domestic market. Moreover, the overall business environment of low-risk countries may provide favorable conditions in the process of searching for and developing the resources that the firm is looking for (Getachew & Beamish, 2021). In sum, firms will pursue a second alternative to acquire domestic resources by going after low-risk resource acquisitions in low-risk countries.

This is reinforced by the fact that pursuing risky resources in foreign markets may be costly for the firm (Amit & Wernerfelt, 1990; Miller & Chen, 2003). Compared to the domestic setting, international operations come with unexpected contingencies due to firms' unfamiliarity with the environment (Zaheer, 1995). Under such circumstances, increasing operational volatility by investing in riskier resource opportunities makes it even more difficult to predict and plan the



firm's operations, which may require the firm to prepare excess inventories and the capacity for resources that may or may not be acquired. Firms that have difficulty in flexibly redeploying their assets may face disadvantages in terms of cost efficiency, which may ultimately damage the firm's cash flow. Such costs will be burdensome for firms because they have already committed to going international; more importantly, they are facing increased domestic competition. Overall, when pursuing international strategies as a response to domestic factor market competition, firms are likely to be consistent in pursuing safer strategies from the start (i.e., internationalization) to end (i.e., IRT).

*Hypothesis 3: There will be a negative association between domestic factor market competition and IRT in low-risk countries.*

## Methodology

### Data and sample

We construct investment risk measures using hand-collected data from the 10-k disclosures of all publicly traded U.S.-domiciled oil and gas companies (SIC 1311 Crude Oil and Natural Gas) within the period of 1996 to 2015 for this study. Oil and gas firms report information regarding the "Costs Incurred in Natural Gas and Oil Exploration and Development, Acquisitions and Divestures" in their 10-k disclosures. These reports contain information on each firm's capital expenditures for drilling and reserve acquisition activities. The Financial Accounting Standards Board clearly specifies the definitions regarding these exploratory and development costs (Financial Accounting Standards Board, 2010: 60):

- *Exploratory well:* A well drilled to find and produce oil or natural gas reserves not classified as proved to find a new reserve in a field previously found to produce oil or natural gas in another reserve or to extend a known reserve.

- *Development well*: A well drilled within the proved area of an oil or gas reserve to the depth of a stratigraphic horizon known to be productive.
- *Proved reserves*: An underground formation containing a natural accumulation of producible oil or gas that firms can expect to recover through existing wells with existing equipment and operating methods.
- *Unproved reserves*: Properties with no proved reserves.

According to the above classifications, we may delineate two types of activities, namely exploration and development activities. These activities involve differing levels of risk to the upstream oil and gas firm. Exploration activities include identifying areas that may warrant investigation, examining specific areas with prospects of containing oil or gas reserves, or drilling exploratory wells, all of which would be considered high-risk activities for the firm. Comparatively, development activities involve obtaining access to proved reserves and drilling development wells, both of which would be considered low-risk activities for the firm. As a result, the corresponding dataset represents an ideal setting where we may observe and compare firms' objective risk-taking behavior.

Among oil and gas firms, most disclose specific information on the whereabouts of their expenditures regarding their exploration and development investments. Therefore, we further collect data on the amount of capital expenditure as well as the country location of the investments to identify whether these investments are made domestically (U.S.) or internationally. Additional financial and accounting information of the firm are obtained from Compustat. The resulting final dataset includes 198 firms and 1,240 firm-year observations.

Dependent variables

*Domestic risk-taking (DRT).* Following Gilje (2016), we categorize all exploration activities such as investments in drilling exploratory wells or acquiring unproved reserves as high-risk activities. On the other hand, we classify all development activities such as drilling development wells or acquiring proved reserves as low-risk activities. Thus, we construct high- and low-risk investments for firm  $i$  in year  $t$  as follows:

$$\text{High risk investment}_{i,t} = \text{Exploratory drilling}_{i,t} + \text{Acquisition of unproved acreage}_{i,t}$$

$$\text{Low risk investment}_{i,t} = \text{Development drilling}_{i,t} + \text{Acquisition of proved acreage}_{i,t}$$

To construct our dependent variables, we further differentiate whether the high- or low-risk investments take place domestically or internationally. To represent risk-taking behaviors in the domestic market (U.S.), we construct *domestic risk-taking* as a ratio variable where *domestic risk-taking* for firm  $i$  in year  $t$  is as follows:

$$\text{Domestic risk taking}_{i,t} = \frac{\text{Domestic high risk investment}_{i,t}}{\text{Total domestic investment}_{i,t}}$$

*Low-risk countries.* We construct a dummy variable to examine whether firms enter low-risk countries when going abroad, where the variable takes the value of 1 when firms enter such countries. The countries that U.S. oil and gas firms choose to enter vary widely, from more developed markets such as the U.K., Canada, and Australia to developing markets such as Gabon, Ecuador, and Indonesia. To identify whether a country is less risky, we rely on the International Country Risk Guide's (ICRG) composite measure of country risk, which has been widely used in studies examining host country entry decisions (Grøgaard, Rygh, & Benito, 2019; Lu et al., 2014). For a given year, if a host country's composite country risk score is higher than that of the U.S., we regard that country as a low-risk country, and vice versa.

*International risk-taking (IRT).* As with DRT, we take a similar approach in constructing IRT. Therefore, *International risk-taking* is a ratio variable indicating international high-risk investments to total investments made in exploration as well as development activities in foreign markets. However, given that our interest is in observing investment behaviors in low-risk countries as a response to domestic competition, we focus only on the international investments made in such countries when constructing our IRT measure. Accordingly, IRT for firm  $i$  in year  $t$  is operationalized as follows:

$$\text{International risk taking}_{i,t} = \frac{\text{International high risk investment}_{i,t}}{\text{Total international investment}_{i,t}}$$

Independent variables

*Domestic factor market competition.* Given that our context is the U.S. upstream oil and gas industry, we believe that unique measures are required to capture domestic factor market competition for upstream oil and gas firms. Specifically, we argue that, for upstream oil and gas firms, competition takes place in the form of attempting to acquire promising oil and gas reserves ahead of the focal firm's industry peers. Therefore, we went through each firm's 10-k reports to hand-collect how much domestic and foreign proved reserves in terms of the natural gas (MMcf, one million cubic feet) and oil (Mbbbl, one thousand barrels) that each firm possesses.

With these variables, we first compute the total domestic proved reserves that each upstream oil and gas firm has by measuring the sum of the domestic proved reserves in both natural gas and oil. Afterwards, for a focal firm, we measure the growth rate of the domestic proved reserves of all other industry peers from time  $t-1$  to time  $t$ . Finally, we compute the difference between the industry peers' growth rate to that of the focal firm to construct our domestic competition variable. A higher value of this variable means that other firms in the

industry are aggressively increasing their domestic proved reserves compared to the focal firm. This, in turn, would mean that there will be fewer available reserves left for the focal firm to exploit and develop in the domestic market. This will naturally result in increasing competitive threats for the focal firm.

#### Control variables

Our analysis includes multiple control variables that are expected to affect firm risk-taking behaviors as well as internationalization. Older and larger firms may have more experience and resources that may enable them to go international and take risks abroad. Therefore, we control for *firm age*, which is the logged number of years since the firm's founding year in a given year and *firm size*, which is computed as the natural logarithm of a firm's total assets in a given year. Previous research has shown that the firm's performance may influence its risk-taking (Harris & Bromiley, 2007; Mishina, Dykes, Block, & Pollock, 2010; Wiseman & Bromiley, 1996). We therefore control for *firm performance* with Tobin's Q.

We control for organizational slack because firms with abundant slack may have the capability and resources to go abroad (Lin, 2014; Lin et al., 2009) and pursue riskier choices (Greve, 2003; Mishina et al., 2010). We therefore include three measures of organizational slack, namely *absorbed slack* (the ratio of selling, general, and administrative expenses to sales), *unabsorbed slack* (the ratio of cash and marketable securities to liabilities), and *potential slack* (the ratio of debt to equity). We also control for the *total proved reserves* of each firm, which is measured by the logged value of total proved reserves in terms of the natural gas (MMcf, one million cubic feet) and oil (Mbbbl, one thousand barrels) of the focal firm.

A large body of prior research on risk-taking emphasizes the role of CEO characteristics (Chatterjee & Hambrick, 2011; Cho, Arthurs, Townsend, Miller, & Barden, 2016; Li & Tang, 2010). To account for the potential influence of CEOs, we include *CEO tenure*, which is the logged value of the CEO's tenure, and *CEO founder*, a dummy variable that takes the value of 1 if the CEO is the founder of the firm. Firms may also face varying levels of host country risks that may influence their host country entry as well as their IRT. We therefore control for *host countries' risk exposure*, which is an aggregate measure of host countries' risk. This measure is calculated by weighting each firm's international investments with the respective host countries' risk score via utilizing the ICRG composite measure of country risk. A higher score means that the firm is exposed to higher host country risks overall.

At the macro level, we control for *domestic market uncertainty*. This variable is operationalized by using the generalized autoregressive conditional heteroskedasticity (GARCH) models (Folta & O'Brien, 2004; Lee & Makhija, 2009), where we collect the daily time-series data of the BP Prudhoe Bay royalty trust (BPT) stock prices. We applied the GARCH models to each of the individual time series of BPT prices, which enables us to estimate daily conditional variances. These conditional variances represent the uncertainty in the domestic market, which is unpredictable regarding any trend that might exist for each period in the time series. Afterwards, we average the daily conditional variances on a yearly basis as our estimate of domestic market uncertainty. We also control for annual *crude oil price* because high oil prices may encourage firms to increase their investments to achieve higher output of oil and gas (Stadler, Helfat, & Verona, 2013). Annual crude oil price data are collected from the U.S. Energy Information Agency, which provides the U.S. crude oil domestic acquisition costs by refiners.

The explanatory and control variables are lagged one year to reduce reverse causation concerns. In addition, we winsorized the study variables at the 1st and 99th percentiles of their empirical distributions to mitigate the influence of outliers. We include year-fixed effects to control for unobserved heterogeneities arising from temporal trends.

#### Analytical approach

For models examining DRT, we adopt a firm-fixed panel OLS regression as our empirical model. In examining firms' entry into low-risk countries, it is important to acknowledge that when a firm enters low-risk countries, it must first make the decision to internationalize. Our data reveal that approximately 24% of our sample firms actually venture abroad, which suggests the potential problem of self-selection in our sample. To address this problem, we conduct Heckman's (1979) two-stage model: in the first stage, we estimate a firm's probability of going international with a probit selection model. In the second-stage model, we examine the relationship between domestic competition and entrance into low-risk countries.

Heckman's two-stage model requires the inclusion of a variable that appears in the first-stage selection model but not in the second-stage model. Therefore, we include the variable *foreign exchange (FX) hedging* because firms that have engaged in extensive FX hedging may be less exposed to the exchange rate risk, thereby reducing complications when going abroad. The variable *FX hedging* is operationalized by Hoberg and Moon (2017)<sup>1</sup>, who conduct a text-analysis on firms' 10-k reports. They first search whether the firm uses FX hedging based on three word-list categories: (a) "Foreign exchange" or "Currency"; (b) "Forward", "Future", "Option", "Hedge" etc.; and (c) "Contract", "Obligation", "Transaction", etc. If the firm uses one

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<sup>1</sup> Data are available at <http://faculty.marshall.usc.edu/Gerard-Hoberg/HobergMoonDataSite/index.html>

word from each category in proximity of each other within a paragraph, one can conclude that the firm uses FX hedging. Afterwards, FX hedging is computed as  $\log(1 + \text{number of times a firm mentions FX derivatives})$ , which is the variable we use in our study. As expected, we find that the variable *FX hedging* is significantly related to a firm's likelihood of going international (Table 3). We include the inverse Mills ratio (generated in the first-stage probit model) in the second-stage model to correct for potential selection bias (Sartori, 2003).

We take a similar approach when examining firms' IRT activities in low-risk countries. We must first acknowledge that firms that have gone international ( $n = 304$ ) may further choose to select themselves into low-risk countries ( $n = 193$ ), as opposed to high-risk countries. Therefore, for firms that have gone international, we apply Heckman's two-stage model, where the first-stage predicts firms' likelihood of entering low-risk countries. Afterwards, in the second model, we examine firms' IRT activities in low-risk countries. As required by the Heckman model, we include *international diversification* in the first-stage model, as internationally diversified firms may find it easier to enter low-risk countries. We operationalize international diversification by adopting the entropy index (Hitt et al., 1997; Wiersema & Bowen, 2008), which is represented by the following equation:  $\sum_{i=1}^N P_i \ln(1/P_i)$ , where  $P_i$  represents the proportion of investments in country  $i$  to country  $N$  for a firm (Palepu, 1985). We find that international diversification is significant in the first-stage model (Table 4).

## Results

Table 6 presents the means, standard deviations, and correlations for all study variables. The correlations among the variables do not seem problematic, and the mean variance inflation factor (VIF) score for all variables is 2.36, which is far below the recommended threshold score of 10.



Thus, multicollinearity is not a major issue. We do find that the variable *total proved reserves* is highly correlated with our measure of *firm size* (0.847). This is natural, given that the largest asset for upstream oil and gas firms would be their proved reserves. We find that our empirical results remain qualitatively similar when we use one of the two variables. In addition, we find a high correlation between *low-risk countries* and *foreign exchange hedging/international diversification*. However, they are not included in the same empirical models.

Table 6. Means, standard deviations, and correlation among variables

Variable	1	2	3	4	5	6
1 DRT	1.000					
2 Low-risk countries	-0.016	1.000				
3 IRT	0.255	-0.225	1.000			
4 Domestic factor market competition	0.018	0.047	-0.164	1.000		
5 Firm age	-0.077	0.195	-0.212	0.146	1.000	
6 Firm size	-0.067	0.287	-0.379	0.034	0.095	1.000
7 Firm performance	0.157	-0.082	0.237	-0.033	-0.103	-0.221
8 Absorbed slack	0.242	-0.066	0.277	0.013	-0.078	-0.211
9 Unabsorbed slack	0.098	-0.086	0.221	0.030	-0.016	-0.240
10 Potential slack	-0.031	0.067	-0.181	-0.043	-0.024	0.110
11 Total proved reserves	-0.139	0.317	-0.383	0.022	0.121	0.847
12 CEO founder	0.084	0.043	0.026	-0.061	-0.291	0.062
13 CEO tenure	-0.001	-0.067	0.087	0.074	0.252	-0.122
14 Host countries risk exposure	0.078	0.463	0.085	0.052	0.115	0.120
15 Domestic market uncertainty	0.012	0.002	0.064	-0.030	-0.048	-0.110
16 Crude oil price	-0.010	-0.149	0.027	-0.019	0.007	0.244
17 Foreign exchange hedging	-0.038	0.504	-0.141	0.060	0.204	0.376
18 International diversification	-0.022	0.682	-0.291	0.064	0.254	0.337
Mean	0.302	0.157	0.374	0.173	2.727	6.173
Standard Deviation	0.278	0.364	0.302	0.995	0.691	2.470

Variable	7	8	9	10	11	12
7 Firm performance	1.000					
8 Absorbed slack	0.251	1.000				
9 Unabsorbed slack	0.328	0.151	1.000			
10 Potential slack	-0.091	-0.038	-0.078	1.000		
11 Total proved reserves	-0.216	-0.339	-0.329	0.104	1.000	
12 CEO founder	0.029	-0.033	0.033	0.035	0.041	1.000
13 CEO tenure	-0.006	-0.071	0.006	0.020	-0.109	0.151
14 Host countries risk exposure	0.181	0.032	0.128	0.050	0.109	-0.010

Table 6, continued

15	Domestic market uncertainty	-0.068	0.028	-0.016	-0.002	-0.048	0.049
16	Crude oil price	-0.030	-0.032	0.045	0.002	0.071	-0.100
17	Foreign exchange hedging	-0.070	-0.056	-0.067	0.005	0.371	0.001
18	International diversification	0.005	-0.050	0.003	0.044	0.314	-0.038
Mean		1.534	0.470	0.562	0.773	11.867	0.270
Standard Deviation		1.246	2.032	2.317	2.097	2.729	0.444
Variable		13	14	15	16	17	18
13	CEO tenure	1.000					
14	Host countries risk exposure	0.019	1.000				
15	Domestic market uncertainty	-0.006	-0.022	1.000			
16	Crude oil price	-0.007	-0.093	-0.346	1.000		
17	Foreign exchange hedging	-0.065	0.316	0.010	-0.065	1.000	
18	International diversification	-0.051	0.690	0.005	-0.151	0.495	1.000
Mean		2.046	6.231	-7.530	61.141	0.686	0.133
Standard Deviation		0.875	15.641	0.238	30.800	1.814	0.284

Note: Correlations  $\geq |0.056|$  are significant at the  $p < 0.05$  level; 1,240 firm-year observations.

We report our firm-fixed panel OLS regression results, with DRT as the dependent variable in Table 7. Model 1 presents the model with only the control variables, whereas Model 2 tests the hypotheses regarding DRT. In Model 2, a positive and significant coefficient of domestic factor market competition ( $\beta = 0.015$ ,  $p < 0.01$ ) provides strong support for H1, which proposed a positive association between domestic factor market competition and DRT.

Table 7. Firm-fixed panel OLS regression results

DV: Domestic risk-taking (DRT)	Model 1	Model 2
Domestic factor market competition (H1)		0.015** (0.005)
Firm age	0.045 (0.039)	0.032 (0.039)
Firm size	0.052*** (0.015)	0.048*** (0.015)
Firm performance	0.015* (0.006)	0.013* (0.006)
Absorbed slack	0.005 (0.005)	0.006 (0.005)
Unabsorbed slack	0.007*	0.007*

Table 7, continued

	(0.003)	(0.003)
Potential slack	-0.000	0.000
	(0.003)	(0.003)
Total proved reserve	-0.003	0.001
	(0.011)	(0.011)
CEO founder	0.014	0.011
	(0.032)	(0.032)
CEO tenure	0.007	0.007
	(0.009)	(0.009)
Domestic market uncertainty	-1.250**	-1.265**
	(0.437)	(0.436)
Crude oil price	-0.002†	-0.002†
	(0.001)	(0.001)
Constant	-9.667**	-9.780**
	(3.379)	(3.369)
Year fixed effects	Included	Included
Firm fixed effects	Included	Included
Within R <sup>2</sup>	0.051	0.058
Number of firms	198	198
Number of observations	1,240	1,240

†  $p < 0.1$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$   
Standard errors are in parentheses.

Table 8 shows the result of the Heckman regression analysis, with low-risk countries as the dependent variable. Model 1 presents the first-stage model, which predicts the likelihood of our sample firms going international. Models 2-3 represent the second-stage models, where we test the study's hypotheses regarding low-risk countries. In Model 3, we find that the coefficient of domestic factor market competition is positive and significant ( $\beta = 3.416$ ,  $p < 0.001$ ), which provides strong support for H2. We find no significant results when we run the same model testing for the likelihood of entering high-risk countries. In conducting the Heckman models, we find that the main explanatory variable (domestic factor market competition) is not significant in the first-stage model, which may suggest weak sample selection bias (Certo, Busenbark, Woo, & Semandi, 2016). We therefore conduct a separate panel logit regression analysis only with the

sample of firms that have gone international (n = 304). The results become weaker but remain qualitatively similar with the results of the Heckman analysis.

Table 8. Heckman regression results (entering low-risk countries)

	First-stage selection model (DV: Internationalization)	Second-stage outcome model (DV: Low-risk countries)	
	Model 1	Model 2	Model 3
Domestic factor market competition (H2)	0.297 (0.209)		3.416*** (1.019)
Lagged DRT	-0.966 (0.799)	-2.034 (4.844)	2.026 (6.045)
Firm age	0.425 (0.374)	0.167 (1.783)	3.144† (1.687)
Firm size	-0.368* (0.170)	6.299*** (1.842)	-0.729 (3.192)
Firm performance	0.605*** (0.156)	-8.077*** (1.680)	-4.977** (1.605)
Absorbed slack	0.055 (0.112)	8.859*** (2.345)	11.43* (4.674)
Unabsorbed slack	-0.006 (0.093)	-17.09*** (2.510)	-30.55*** (6.581)
Potential slack	0.152 (0.099)	-1.352 (1.587)	-0.150 (1.305)
Total proved reserves	1.032*** (0.176)	-5.301** (1.900)	0.561 (2.931)
CEO founder	0.546 (0.639)	7.884*** (2.305)	5.897 (3.878)
CEO tenure	-0.249 (0.186)	-0.770 (0.795)	-0.300 (0.824)
Host countries risk exposure		0.165** (0.061)	0.031 (0.061)
Domestic market uncertainty	1.885 (5.717)	-29.89* (16.19)	-50.61 (61.31)
Crude oil price	-0.046*** (0.012)	-0.197** (0.064)	-0.069 (0.142)
Foreign exchange hedging	0.446** (0.145)		
Inverse Mills Ratio		1.179 (0.879)	0.687 (0.887)
Constant	-0.785 (44.66)	-197.4 (125.3)	-405.6 (484.5)
Year fixed effects	Included	Included	Included

Table 8, continued

Wald chi square	82.66***	268.08***	185.03***
Number of firms	198	48	48
Number of observations	1,240	304	304

†  $p < 0.1$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

Standard errors are in parentheses.

Finally, Table 9 presents the result of the second Heckman regression analysis, with IRT as the dependent variable. Model 1 is the first-stage model, where we test the likelihood of our sample firms entering low-risk countries. For this reason, we only use firms that have gone international, as in our sample. Models 2-3 represent the second-stage models, which test the main variable of interest, IRT. In Model 3, the coefficient of domestic competition is negative and marginally significant ( $\beta = -0.047$ ,  $p = 0.068$ ), thus providing weak support for H3. For similar reasons above (Certo et al., 2016), we conduct a separate panel OLS with the sample of firms that have entered low-risk countries ( $n = 193$ ). We find qualitatively similar results with the Heckman analysis.

Table 9. Heckman regression results (risk-taking activities in low-risk countries)

	First-stage selection model	Second-stage outcome model	
	(DV: Low-risk countries)	(DV: IRT)	
	Model 1	Model 2	Model 3
Domestic factor market competition (H3)	0.005 (0.137)		-0.047† (0.026)
Lagged DRT	-0.027 (0.485)	0.268** (0.095)	0.235** (0.097)
Firm age	0.266 (0.182)	-0.040 (0.041)	-0.041 (0.041)
Firm size	-0.485*** (0.129)	0.049 (0.040)	0.049 (0.040)
Firm performance	-0.540*** (0.149)	0.070 (0.066)	0.088 (0.066)
Absorbed slack	0.190 (0.463)	-0.065 (0.123)	-0.057 (0.122)
Unabsorbed slack	-0.902**	0.307*	0.306*

Table 9, continued

	(0.310)	(0.127)	(0.126)
Potential slack	0.016	-0.022*	-0.022*
	(0.073)	(0.010)	(0.010)
Host countries risk exposure	0.000	-0.003**	-0.003**
	(0.006)	(0.001)	(0.001)
Total proved reserves	0.320**	-0.047	-0.045
	(0.123)	(0.036)	(0.036)
CEO founder	1.719***	-0.088	-0.108
	(0.308)	(0.096)	(0.097)
CEO tenure	-0.213†	-0.011	-0.008
	(0.113)	(0.025)	(0.025)
Domestic market uncertainty	2.065	-0.615	-0.560
	(3.398)	(0.943)	(0.937)
Crude oil price	0.004	-0.002	-0.002
	(0.007)	(0.001)	(0.001)
International diversification	0.969**		
	(0.355)		
Inverse Mills Ratio		-0.143	-0.156
		(0.133)	(0.133)
Constant	19.68	-3.814	-3.388
	(35.09)	(7.402)	(7.351)
Year fixed effects	Included	Included	Included
Wald chi square	57.82***	48.16*	51.38**
Number of firms	48	33	33
Number of observations	304	193	193

†  $p < 0.1$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

Standard errors are in parentheses.

## Discussion

Our study starts by investigating the relationship between domestic factor market competition and firm risk-taking behaviors. In the process, we question whether domestic factor market competition may have distinct influences on DRT, internationalization, and IRT. By examining the proposed relationships, we show that increasing domestic factor market competition indeed has unique behavioral implications, which at its core, illustrates firms' endeavors to avoid direct competition for resources.

We make multiple contributions to the literature. The current study builds on previous studies that examine how competitive pressure may influence firms' risk-taking endeavors (McCann & Bahl, 2017; Raith, 2003; Shinkle & McCann, 2014; Stagni et al., 2021; Wang & Shaver, 2014; Weigelt & Shittu, 2016). Our paper is different from prior studies on two points. First, while related papers examine performance implications (such as new product introductions to represent risk-taking activities in response to competition), we examine behavioral implications by looking at the investment activities (i.e., drilling and acquisition of reserves) of U.S. upstream oil and gas firms.

Second and more importantly, we show that, to understand how competition affects firm risk-taking, there needs to be an understanding of competition itself. As with our study, competition may take place in specific regions that may have distinct influences on firm risk-taking activities in different locations. Similarly, there may be different types of competition that may or may not push the firm to take risks. For example, in innovative industries such as the biotech and pharmaceutical sectors, competition for innovation is high. Therefore, such competitive pressures will motivate firms to take risks and engage in exploration by investing in R&D (Chen & Miller, 2007; Devers, McNamara, Wiseman, & Arrfelt, 2008). Conversely, in industries that are more labor intensive and where efficiency is valued, competition for cost reduction will be high. In such sectors, firms may reduce their risk-taking and instead increase exploitation to further improve their current capabilities (Stagni et al., 2021). Such examples call for a better understanding of how competition is perceived by the focal firm.

We also shed light on firms' IRT, which still remains a relatively novel subject in the management literature. Whereas a number of studies have considered internationalization as a

form of risk-taking behavior (Berger et al., 2017; Carpenter et al., 2003; Jung & Bansal, 2009; Lin et al., 2009), we identify IRT as a unique research opportunity by theoretically and empirically distinguishing IRT from internationalization in the current study. We believe that there needs to be further understanding of what drives firms to take risks in foreign markets, where the level of risk is inherently higher than that of domestic markets (Hymer, 1976; Zaheer, 1995). This may be done by examining the domestic market characteristics or by taking a more international approach by starting with the attributes of foreign markets.

With the second approach, traditional IB frameworks may be useful. For example, Dunning's (2000) OLI paradigm may be helpful in examining IRT. Firms may be more likely to engage in IRT in foreign markets, which would allow them to benefit from their high ownership advantages through established business-friendly institutions that would enable firms to have better control over the IRT process. Johanson and Vahlne's (1977) Uppsala model may be another useful tool, which would suggest that among foreign markets in which the firm has invested, firms would be more likely to increase their IRT in markets where the psychic distance is closer due to fewer complexities. One may go further by considering the firm's subsidiary network configurations to see whether more or less diversified networks may influence firm IRT in different host countries. While we make our own contributions by examining firms' IRT in low-risk countries, we believe that there is more room for research in understanding firms' IRT.

Finally, we contribute to the factor market competition literature with our empirical findings (Barney, 1986). The value of the study, however, is more than merely providing an empirical context to examine factor markets, which has largely been absent in the literature. We show that factor market competition may go beyond the two options of strengthening one's own



resource position (either by accumulation or acquisition) or directly attacking the competitor's resource position (Capron & Chatain, 2008; Markman et al., 2009). Firms may actually do both simultaneously with their investment strategies, where investment in the focal firm's resource position may indirectly limit competitors' resource growth at the same time. This may especially be the case where resources are finite and difficult to redeploy to multiple firms (Asmussen, 2015). In addition, while many studies emphasize the potential influence of product markets on factor market competition (Asmussen, 2015; Chatain, 2014), we focus only on the factor market by leveraging the context of the upstream oil and gas industry where products are more or less homogenous among firms. Therefore, we can tease out the contingencies of product markets and achieve a finer-grained understanding of how firms interact within the factor market.

With the findings of the current study, we provide implications to practitioners who may not be confined to the U.S. upstream oil and gas industry. While we find that firms increase their DRT in response to domestic factor market competition, it is important to acknowledge that risk-taking endeavors by definition have their own perils (e.g., a high likelihood of failure with exploratory drilling). Therefore, it may be important for firms to invest in relevant assets, information, or resources that can maximize the fruitfulness of DRT (e.g., investing in better seismic technology or drilling equipment) as a response to domestic factor market competition. In addition, when firms go international, reducing their IRT in host countries may limit their growth potential at the same time, making these firms vulnerable to competition in foreign markets. To overcome such liabilities, the firm may have to consider establishing constructive relationships with host country stakeholders such as the government, suppliers, and competitors.

These stakeholders may enable the focal firm to pursue more IRT by reducing the costs of doing business abroad (Hymer, 1976; Zaheer, 1995).

The current study is not without limitations. Nonetheless, by addressing these limitations, we hope to offer new insights into how future studies may leverage the current study and provide new contributions to the literature. Regardless of our attempt to make generalizable theoretical arguments, our empirical context presents the issue of generalizability, as we focus on one specific industry in a single country, namely the U.S. upstream oil and gas industry. By doing so, we examine domestic competition only within the factor market because the products are largely homogenous in the upstream oil and gas industry. In this industry, product market competition is mainly controlled by crude oil (natural gas) prices. While we believe that the uniqueness of our context enables us to delve into our research question, other contexts may provide interesting new agendas. For example, how would firms respond to domestic factor market competition in their global product markets? If we use the wisdom gleaned from the competitive dynamics literature (Chen, 1996; Markman et al., 2009), we may predict that the firms' response to domestic factor market competition would depend on the market overlap in factor (as well as product) markets, domestically and internationally. At the extreme, if two firms face large factor and product market overlaps in both domestic and international countries, our findings would suggest that the two firms will exhibit maximum mutual forbearance by engaging in more conservative behaviors to avoid competition.

In addition, due to data limitations, we do not observe how foreign competition in foreign markets play a role in the story. Based on the current study's findings, we would expect foreign competition in foreign factor markets to motivate firms to increase their IRT in the host countries

to avoid direct competition with foreign competitors. To take one step further, an interesting avenue would be to examine the interplay between domestic and foreign competition.

Competitive pressure is asymmetric (Chen, 1996); therefore, firms may perceive different levels of competitive pressure from domestic and foreign competition. How would firms' risk-taking behaviors differ when they perceive greater competitive pressure from domestic over foreign competitors? Would they simply disregard foreign competition by reducing their IRT, or would they factor in the difference of the perceived pressure into their IRT activities?

Our study is among the first to address different types of firm risk-taking behaviors (Xu et al., 2019). While we do not directly explore this question in the current study, one interesting research avenue may be to explore how one type of risk-taking activity may influence another. In other empirical settings, how would DRT affect IRT, and vice versa? While there are studies that examine the sequence of similar risk-taking activities (Benartzi & Thaler, 1999; Webb & Shu, 2018), there is limited understanding in terms of how distinct risk-taking may either become antecedents or consequences of one another (Hoskisson, et al., 2017). This gap in the literature is surprising, given that a firm's decision-making process is fundamentally a sequence of different risk-taking decisions. Of course, to conduct such studies, one would need to first identify different types of risk-taking activities. For example, firms may engage in risk-taking because they have slack resources (Chen, 2008; Greve, 2003; Iyer & Miller, 2008) or because they have no other choice but to make radical strategic changes (Audia & Greve, 2006; Kuusela, Keil, & Maula, 2017). On the other hand, some firms may engage in risk-taking based on carefully evaluated estimates (Knight, 1921), whereas other firms may take risks, depending on 'gut

feelings' (March & Shapira, 1987). Could it be possible that there may be a relationship between such different types of risk-taking behaviors?

### Conclusion

We begin this article by articulating how firms may respond to domestic competition. By pursuing the idea that firms will mainly attempt to avoid competitive threats, we examine their investment behaviors as a response to domestic competition to verify our conjectures. In the process, the current study leverages a unique context of the U.S. upstream oil and gas industry, where we find that domestic competition may influence firm internationalization as well as distinct risk-taking activities in different locations. We believe that our study is a mere starting point. We hope that the current study's findings can open a new dialogue in the literature by prompting future research in exploring how various external threats and opportunities may either motivate or hinder different firm risk-taking activities.

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**CHAPTER 3**  
**REAL OPTIONS FLEXIBILITY OR RISK DIVERSIFICATION:  
RISK MANAGEMENT OF U.S. MNEs WHEN FACING RISK OF WAR<sup>2</sup>**

Abstract

Our study examines how U.S. multinational enterprises (MNEs) strategically respond to the risk of war in South Korea, which is prompted by North Korea's continued threatening actions. We compare predictions of real options theory and risk diversification theory, both of which offer differing predictions on how MNEs utilize their global networks of subsidiaries when managing host country risks. Empirical results show that U.S. MNEs adopt the portfolio investment strategy (based on risk diversification theory) when facing the risk of war. However, we find that while the ownership structure of operations (wholly owned or joint venture) in South Korea does not moderate U.S. MNEs' strategic choices, U.S. MNEs with more available foreign markets tend to shift toward operational flexibility (based on real options theory). By leveraging a unique context in which the risk of war influences MNEs' strategic behaviors, we contribute to the literature by showing that MNEs' operational flexibility and portfolio management strategies may become interchangeable, depending on the foreign investment of the MNEs' configurations.

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## Introduction

How do multinational enterprises (MNEs) deal with risk in a particular host country in terms of managing their subsidiaries? To answer this question, the current paper focuses on how U.S. MNEs strategically respond to the risk of war in a host country. While it has been widely acknowledged that various forms of host country risks heavily influence MNEs, less is known about how MNEs deal with risk of war in a host country in terms of their subsidiaries. Specifically, related studies have touched upon how MNEs cope with such host country risks with a focus on the subsidiary in the host country with risk of military violence (Dai, Eden, and Beamish, 2013, 2017; Getz and Oetzel, 2010; Li and Vashchilko, 2010; Oetzel and Oh, 2014; Oh and Oetzel, 2011, 2017). However, there is less discussion regarding how MNEs may deal with such risks in a more holistic manner involving the MNE's entire subsidiary portfolio. This gap is surprising in that the impact of risk of war in one country may not be isolated only for the MNE subsidiaries in that country, but rather likely to bring an overall impact to the MNE.

Equally as important, prior studies on how MNEs deal with host country risks in general show less consistency in terms of theoretical arguments and findings. This may be because there fundamentally exist two established theories that offer differing insights into how MNEs may cope with host country risks, namely real options theory and risk diversification theory. On one hand, real options literature predicts that MNEs take advantage of their global subsidiary networks in order to deal with host country risks by flexibly shifting operations across borders (Kogut and Kulatilaka, 1994). On the other hand, from the risk diversification theory standpoint, the very purpose of MNEs investing in foreign operations is to reduce performance variability among subsidiaries (Hisey and Caves, 1985; Rugman, 1976, 1979). As a result, MNEs would not

utilize their networks of subsidiaries in order to mitigate downside losses. Rather, MNEs would attempt to minimize their exposure to the particular risk in the host country. Thus, real options theory and risk diversification theory predict mutually exclusive approaches for how MNEs treat their foreign subsidiaries when coping with host country risks.

In line with these contradictory predictions, the stream of literature based on real options theory shows how MNEs choose to utilize their multinational operations, such as shifting operations across-borders to take advantage of fluctuating exchange rates in domestic operations (Lee and Song, 2012; Rangan, 1998). However, another stream of literature based on risk diversification theory shows how MNEs choose to minimize subsidiary utilization and instead exit the country when facing political conflict risks (Dai et al., 2013, 2017) or financial crises (Chung, Lee, Beamish, Southam, and Nam 2013; Zhou, Li, and Svejnar, 2011). In an effort to bridge the seemingly conflictual literature, we specifically compare two theories—real options theory and risk diversification theory—with competing hypotheses in order to explain how MNEs deal with host country risks.

In the current study, we examine how U.S. MNEs with operations in South Korea strategically respond to the risk of war known to be present in the country. Specifically, we examine whether U.S. MNEs utilize their global networks by shifting operations across borders as predicted by real options theory, or whether they treat their foreign subsidiaries as independent entities in line with the risk diversification theory. To examine which theory prevails, we leverage a unique setting in South Korea, where the imminence of war has been frequent, to test these two competing predictions. We further question whether MNEs that have wholly owned subsidiaries (WOS) in South Korea, compared to those with joint ventures (JV),

would be more likely to exercise operational flexibility. Finally, we test whether MNEs that are dependent on markets outside South Korea will be more prone to exercise operational flexibility, compared to implementing the portfolio investment strategy.

We endeavor to make at least three contributions to the literature. First, our study shows how MNEs utilize their subsidiaries differently when managing host country risks, depending on the MNEs' investment configurations. Specifically, under limited MNE investment configurations, it appears that MNEs benefit more from the portfolio investment strategy, while operational flexibility gains more value as a strategic choice when MNEs have more available markets outside the country at risk of war. Therefore, we shed light on real options theory and risk diversification theory by suggesting that the link between the two seemingly divergent theories collectively explain the MNE's investment configurations. In other words, the two theories are synergetic in explaining the MNE subsidiary configurations.

Second, we contribute to the literature of risk management by showing how MNEs may utilize risk management strategies (i.e., operational flexibility and portfolio investment) interchangeably. Our study reveals that MNEs may be flexible in choosing how to deal with host country risks, which differs from previous studies that tend to focus on single risk management strategies of MNEs. Finally, we contribute to the political risk literature by introducing an interesting, yet specific setting of political risk in a single-country setting in South Korea where risk of war has been present with the possibility of an outburst for decades. By leveraging the context of armistice in the Korean peninsula, we bring new insights for both theory and phenomena.

#### Hypotheses development



## Risk of war as political risk

The management literature has long categorized political violence such as terrorism, expropriation, military conflicts, and wars as political risk (Kobrin, 1979; Miller, 1992). Previous studies have examined how firms react to political risk in host countries by engaging in corporate political activities (Mbalyohere, Lawton, Boojihawon, and Viney, 2017), adjusting host country entry and expansion decisions (Delios and Henisz, 2003a, b; Oetzel and Oh, 2014; Oh and Oetzel, 2011, 2017), reducing direct investments (Busse and Hefeker, 2007; Henisz, 2002; Li and Vashchilko, 2010), and exiting the country (Dai et al., 2013, 2017). However, many studies have focused on the aggregate level of political risks, resulting in a limited understanding of how specific political risks may have an impact on MNEs' strategic responses.

The current study focuses on a specific form of political risk, which is the risk of war. This risk type is fundamentally political in that it involves interstate political relation (Li, Arikan, Shenkar, and Arikan, 2020; Li and Vashchilko, 2010). Yet, it represents an extreme case of political risk in that at its worst, it may bring about fatal negative impacts on the firm by creating major disruptions in the firm's operations. We focus on the risk of war because its impact on MNEs is more direct and nontrivial in degree (Dai et al., 2017; Li, 2006), compared to other types of political risks. Due to its significance, the risk of war renders MNEs' strategizing endeavors more visible.

Our study differs from previous research focusing on war contexts (Dai et al., 2013, 2017; Getz and Oetzel, 2010; Guidolin and La Ferrara, 2007; Li et al., 2020; Li and Vashchilko, 2010). First, it examines a unique setting in which the risk of war has lingered for decades, yet has never been actually realized. By leveraging this context, we show that even if war is not

taking place, the risk of war still has an influence on firms' behaviors due to its devastating potential impact. Thus, MNEs gauge the potential risk of war and behave accordingly. Second, rather than examining whether firms avoid the risk of war by escaping from the country (Dai et al., 2013, 2017), we question how firms deal with this particular risk while still maintaining operations within the country. We do so by examining not only one form of strategic behavior involving MNEs when faced with the risk of war, but also by comparing two potential strategic choices of MNEs predicted by two opposing theories: real options theory and risk diversification theory.

In South Korea, the risk of war is evident due to the presence of North Korea, which has remained under an armistice with South Korea ever since 1953. Just to name a few incidents, in 1968, 21 armed soldiers were sent from North Korea with the objective to assassinate the South Korean president at the time, Chung-Hee Park, which eventually failed. In 1976, North Korean soldiers killed two U.S. Army officers in the Joint Security Area. These series of malicious actions have continued until very recently, such as the attack on the naval ship Cheonan, resulting in 46 deaths (2010) and the artillery bombing on Yeon-pyeong Island, resulting in four deaths (2010). However, arguably the most intimidating actions of North Korea have been the continuous nuclear experiments since 2006, regardless of the global society's unfruitful efforts to restrict their dangerous actions. Naturally, these streams of events have frequently generated a high amount of risk of war in South Korea. We see unique opportunities here in that the risk of war in South Korea provides a setting where we may observe how the risk of war can influence MNEs' strategic behaviors without resulting in an actual war. This is possible because South Korea and North Korea are the only two countries currently under an armistice in the world.

## Real options theory and operational flexibility

According to real options theory, operational flexibility has its foundations on the premise that international investments provide MNEs with the ability to respond flexibly when encountering certain changes in the environment. In other words, real options theory suggests that most firms possess a certain portfolio of options to defer or stage market entry, pursue growth, alter scale, switch inputs/outputs or abandon a market (Trigeorgis and Reuer, 2017). Particularly for MNEs, Kogut and Kulatilaka (1994) applied this logic to the multinational network of MNEs and proposed that investments in foreign countries grants MNEs access to operational flexibility. In other words, MNEs have the ability to take advantage of multinational networks by flexibly shifting operations across borders. This ability rests on the assumption that MNEs have the discretion to flexibly coordinate operations within their multinational networks. For example, an MNE that has made investments in the international market has the ability to shift productions within the subsidiary network in order to benefit from cost differences among countries (Tang and Tikoo, 1999). In a nutshell, real options theory predicts that MNEs with operational flexibility may “increase internal responsiveness while leaving the predictability of external factors unchanged” (Miller, 1992: 324).

According to real options theory, operational flexibility provides value for the MNE (Allen and Pantzalis, 1996; Lee and Makhija, 2009b) because it “gives managerial discretion to respond profitably to the realization of uncertain events” (Kogut and Kulatilaka, 1994: 125). Based on this logic, previous studies have shown how MNEs actually make use of operational flexibility when faced with changes in the environment. Rangan (1998) observes whether MNEs actually exercise operational flexibility and discovers that MNEs shift operations across borders

when facing changes in exchange rates within the international market. In a similar vein, Lee and Song (2012) show how South Korean MNEs shift production within their intra-MNE networks when experiencing volatile exchange rates. Furthermore, Song (2015) examines how MNEs enhance their performance by flexibly making intra-firm adjustments when the exchange rate fluctuates in the host countries. Following this stream of studies, we focus on the operational flexibility of MNEs, given that MNEs may take advantage of this flexibility by shifting operations across borders in order to curtail downside losses when facing host country risks.

#### Risk diversification theory and portfolio investment

Risk diversification theory predicts that diversifying risk is an important motivation of MNEs with respect to expanding internationally. This international expansion may be achieved by adopting a portfolio investment strategy. Based on this theory, previous studies have shown that foreign operations benefit the firm by stabilizing returns and reducing variability among revenue streams via diffusing its investment risks to different geographic areas (Hissey and Caves, 1985; Kim, Hwang, and Burgers, 1993; Miller and Pras, 1980; Rugman, 1976, 1979). This notion is based on the rationale that the underlying macroeconomic conditions are not highly correlated among different international markets. Comparatively, if a firm were to operate in a single country, it would be influenced by domestic risk factors to a greater extent because the firm's returns would be solely dependent on the single domestic market. Therefore, a significant part of risk that cannot be diversified in a single country can be diversified through international expansion (Lessard, 1983). As Lee and Chung (2007: 22) explain, risk diversification strategy would be "analogous to not putting all one's eggs in one basket." As a result of investing in a portfolio through international expansion, MNEs are able to improve their

performance and reduce risk (Dess, Gupta, Hennart, and Hill, 1995; Grant, Jammine, and Thomas, 1988).

From the perspective of risk diversification theory, a natural response when facing host country risks would be to minimize the MNE's exposure to the particular risk in a host country (Benito, 1997, 2005; Van Den Bulcke, Boddewyn, Martens, and Klemmer, 1979). The most straightforward way for an MNE to reduce exposure to a host country risk would be to reduce operations in that particular country. Dai et al. (2013) show how MNEs decide to remove operations in countries stricken by political conflicts in order to reduce exposure to risk. Similarly, Berry (2013) shows how political and economic risk in a country influence MNEs' decision to minimize operations in that particular country. Likewise, Chung et al. (2013) observe how MNEs choose to avoid risks by reducing operations when facing financial crisis in the host country.

#### Leveraging operational flexibility and risk diversification strategies

Based on real options and risk diversification theories, respectively, operational flexibility and portfolio investment strategies represent seemingly divergent approaches when dealing with host country risk. Specifically, from the portfolio investment perspective, the existence of other foreign subsidiaries excluding the subsidiary in the problematic country would hardly matter in terms of dealing with the host country risk. Unlike the operational flexibility approach, portfolio investment strategy does not treat foreign subsidiaries as a constituent of a global network that MNEs may utilize when facing host country risk. Rather, foreign subsidiaries are independent entities that contribute to reducing MNEs' overall portfolio risk, which should be less than the weighted sum of the individual risks for each subsidiary (Grubel,

1968; Lee and Chung, 2007; Mansi and Reeb, 2002). Therefore, other subsidiaries would play a minimal or no role when strategically dealing with a single host country risk in particular. Their importance lies more in diversifying the risk throughout the entire portfolio of subsidiaries at the time of risk in a focal host country. Figure 2 conceptually compares how operational flexibility and portfolio investment strategies differ in terms of utilizing subsidiaries when dealing with host country risks.

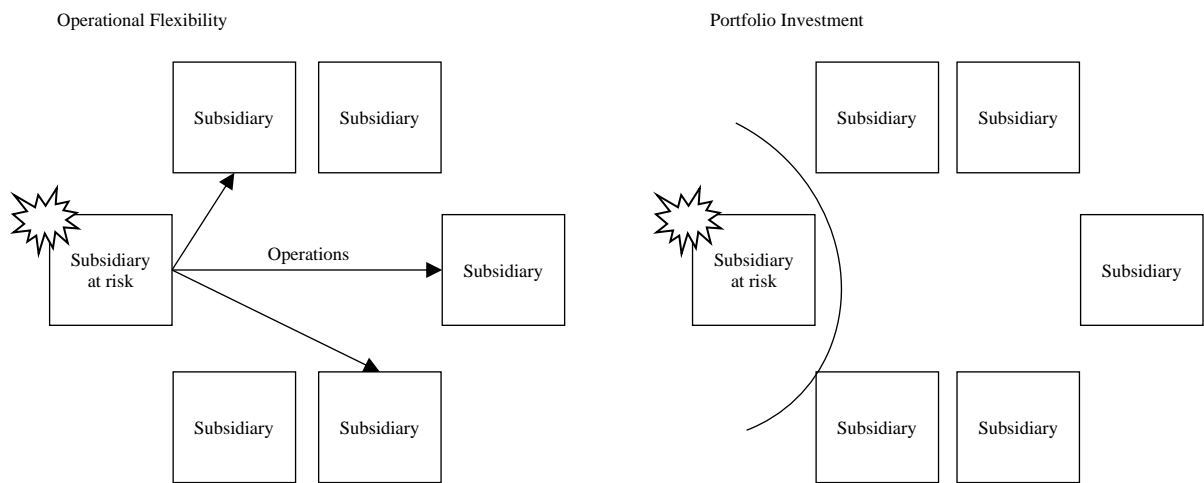


Figure 2. Comparison between the operational flexibility strategy and the portfolio investment strategy

However, as acknowledged by prior literature (Belderbos and Zou, 2009; Trigeorgis, 1996) and evidenced by recent studies (Belderbos, Tong, and Wu, 2020), real options and risk diversification explanations of MNEs may in fact be complementary. This may depend on many factors, such as the characteristics of the MNE’s subsidiary configuration (Belderbos et al., 2020; Fisch and Zschoche, 2012) or the subsidiary’s characteristics (Belderbos and Zou, 2009).

Building upon these studies, we show how the differing subsidiary configurations of the MNE may be an additional link between the two theories.

Real options prediction: The risk of war and operational flexibility

The risk of war in a host country poses major threats for MNEs by potentially harming employees; disrupting firm sales, exports, and supply chain activities; and destroying property, plants, and equipment (Henisz, 2000; Oetzel and Getz, 2012), thereby demanding MNEs' immediate attention. One approach in dealing with such a fatal host country risk is to respond by utilizing the operational flexibility strategy of MNEs. The idea of operational flexibility is based on the premise that international investments provide MNEs with the ability to respond flexibly when encountering certain changes in the environment. In other words, MNEs have the ability to take advantage of multinational subsidiary networks by flexibly shifting their operations across borders and by "respond[ing] profitably to the realization of uncertain events" (Kogut and Kulatilaka, 1994, pp. 125).

Through such operational flexibility, MNEs may shift one subsidiary's operations to another subsidiary, thus mitigating the potential downside risk consequences (Belderbos and Zou, 2009; Reuer and Leiblein, 2000). Such a shift in operations is ultimately likely to cause a shift in sales, given that sales necessarily require a volume of operations for value chain activities. Previous research has shown that MNEs do, in fact, shift their operations across borders, resulting in sales changes (Lee and Song, 2012; Rangan, 1998), with the intention of mitigating downside risks (Lee and Makhija, 2009a, 2009b). Therefore, when facing a high probability of war, MNEs will be likely to react by utilizing their global networks of subsidiaries in terms of shifting operations from the host country to other locations. The goal for MNEs in such a situation is to mitigate possible downside risks by reducing exposure to the risk of war (Kogut and Kulatilaka, 1994). By leaning on operational flexibility, MNEs will be able to restore

their operations and resume their business activities in South Korea when the risk of war subsides.

*Hypothesis 1a: The risk of war in a host country will increase sales outside the focal host country at the expense of (or with a decrease in) sales in the focal host country.*

Risk diversification prediction: The risk of war and portfolio investment

The other approach when dealing with the risk of war would be to implement a portfolio investment strategy. Based on the concept of financial portfolios, portfolio investment benefits firms by stabilizing returns and reducing variability among revenue streams via diffusing their investment risks to different geographic areas (Hisey and Caves, 1985; Kim et al., 1993; Miller and Pras, 1980; Rugman, 1976, 1979). This is because the underlying macroeconomic conditions are not highly correlated among different international markets. Thus, foreign subsidiaries are treated as independent entities that contribute to reducing the overall portfolio risk, which should be less than the weighted sum of the individual risks of each subsidiary (Grubel, 1968; Lee and Chung, 2007; Mansi and Reeb, 2002).

From the perspective of risk diversification theory, a natural response when facing host country risks would be to minimize MNEs' exposure to the particular host country. An important point to note is that from the portfolio investment perspective, the existence of other foreign subsidiaries (other than the subsidiary in the problematic country) would hardly matter in terms of dealing with the host country risk (Chung et al., 2013). Thus, the sales in other subsidiaries would largely be unaffected. As such, while operational flexibility predicts that MNEs will shift their operations when facing the risk of war in a host country, the portfolio investment perspective does not necessarily predict a shift in operations. Rather, high risk in one subsidiary



will not influence operations or sales in other subsidiaries, given that the portfolio investment perspective considers each subsidiary as an independent entity making up the overall portfolio (Rugman, 1976, 1979). Simply reducing direct exposure to the risk will be sufficient in terms of risk diversification because MNEs will still be left with other foreign operations that constitute their international portfolios.

*Hypothesis 1b: The risk of war in a host country will not increase sales outside the focal host country at the expense of (or with a decrease in) sales in the focal host country.*

The role of ownership structure in MNE subsidiaries

Real option operational flexibility logic works the best when the MNEs dictate the coordination among the subsidiaries at a time of risk in a host country (Kogut and Kulatilaka, 1994). In other words, for the MNEs to achieve the utmost operational flexibility, MNEs having control over subsidiaries is an essential precondition.

Following this line of logic, the ownership structure of the subsidiary in a host country may influence the MNE's decision in terms of exercising operational flexibility. More specifically, a WOS is more likely to facilitate the process of shifting operations across borders because the undivided ownership allows the MNE to execute its preferred strategy (Brouthers and Hennart, 2007; Hill et al., 1990). Therefore, one could argue that a WOS structure of the subsidiary benefits the MNE by further granting discretion in dealing with host country risks (Kogut and Kulatilaka, 1994).

Conversely, if the subsidiary is a JV, the MNE will have to communicate and coordinate with the partner when shifting productions across borders, which may potentially result in conflict (Park and Ungson, 2001), thereby making the utilization of operational flexibility more

difficult (Belderbos and Zou, 2007). In addition, the split ownership structure may pose difficulty in maximizing the value of options if the JV represents different positions in the value chains for the firms involved (Triantis, 2005). For example, while one party may place more weight on the flexibility aspect of the subsidiary, the partner firm may be focusing more on achieving growth potential in the country (Song, Makhija, and Lee, 2014). Such conflicting objectives may act as hindrance in taking advantage of operational flexibility when the necessity arise for the MNE. Finally, it is likely that the local partner may be concerned about shifting operations outside the country, as it may result in the partner's reduced importance within the global network of the MNE, thereby leading the partner to resist even further.

*Hypothesis 2a: A wholly owned ownership of the subsidiary, as opposed to a joint venture, will strengthen the positive relationship between the risk of war and increased sales outside the focal host country at the expense of (or decreased) sales in the focal host country.*

The fundamental motivation behind the portfolio investment approach is to manage host country risks by reducing exposure to the risk within the problematic country (Berry, 2013; Chung et al., 2013; Dai et al., 2013). Therefore, coordinating operations with other subsidiaries becomes less of a concern when adopting a portfolio investment strategy, given the fact that each subsidiary is treated independently. That said, the ownership structure of the subsidiary becomes a more relevant issue because more ownership grants the MNE more autonomy in deciding the future trajectory of the subsidiary (Hagedoorn and Nurala, 1996; Luo, 2006). In other words, MNE's control over subsidiaries at risk will facilitate reducing operations in order to minimize exposure to the risk of war in South Korea, on top of the fact that the operations in other countries become less of a concern. Therefore, if the subsidiary is a WOS, the MNE faces less

resistance in reducing operations in South Korea, along with minimal changes in the operations of other subsidiaries, which is in line with the portfolio investment approach.

On the contrary, the shared ownership structure of a JV may make the process more complicated with potentially conflicting interests with the partner firm (Fey and Beamish, 2000; Park and Ungson, 2001; Peng and Shenkar, 2002). At the risk of war, even if the MNE would like to decrease exposure in the host country, the local partner may not want to cooperate. While a subsidiary might be just one investment in a vast portfolio of investments for MNEs that can easily be increased or decreased in size, for local partners this subsidiary can be a much more important investment. This asymmetric importance attached to the subsidiaries between the MNEs and local partners, it would be quite difficult for the MNEs and local partners to integrate the subsidiary into their value chains so that it may maximize the value of the partnership for all parties (Triantis, 2005).

Furthermore, JVs with local partners may prove to be valuable in reducing the risk of the MNE by providing valuable knowledge and experience of the local environment (Chung et al., 2013). This may make it difficult for the MNE to implement portfolio investment strategy given the JV's nontrivial role in buffering the negative impact attached with risk of war. Finally, a local partner may have nowhere else to go, unlike the MNE; thus, the partner would resist reducing operations in South Korea. In sum, having majority ownership of the subsidiary (such as WOS) further facilitates the portfolio investment strategy of MNEs when facing the risk of war.

*Hypothesis 2b: Wholly owned ownership of the subsidiary, as opposed to a joint venture, will strengthen the negative relationship between the risk of war and increased sales outside the focal host country at the expense of (or decreased) sales in the focal host country.*

The role of market dependence outside South Korea

When facing the risk of war in the host country, MNEs will be motivated to exercise operational flexibility by shifting operations from the country at risk to other geographic locations in order to reduce their exposure to the risk. However, even if MNEs have the motivation to shift operations to a different location, the necessary condition would be to have a sufficient amount of alternative options that would enable the operational flexibility approach (Kogut and Kulatilaka, 1994). In other words, operational flexibility requires the focal firm to have a certain degree of market dependence outside the country with the risk of war (Lee and Makhija, 2009a). From the operational flexibility perspective, other available markets become equivalent to the capacity outside the host country. These markets are able to accommodate operations coming from the country with a high risk of war.

Without enough capacity outside South Korea, the MNE may not be able to utilize operational flexibility even if they were motivated to do so (Kogut and Kulatilaka, 1994). More importantly, limited market dependence outside South Korea is likely to increase the incompatibility of operations in South Korea and operations in other foreign subsidiaries, thereby making the shift of value chain activities across countries more difficult (Song et al., 2014). For example, if the MNE was producing basic product parts in other countries and producing more advanced product parts in South Korea, shifting the operations from South Korea to other subsidiaries when facing risk of war may be more difficult with limited market dependence outside South Korea. In other words, MNEs with high market dependence outside South Korea enjoy the privilege of being able to choose the destination of an operational shift, which will maximize the value of their operational flexibility (Belderbos and Zou, 2007; Chi, Li, Trigeorgis, and Tsekrekos, 2019).

In conclusion, highly available markets other than South Korea can become a facilitating factor for MNEs when they are motivated to exercise operational flexibility upon experiencing the risk of war in a host country. This is in line with the findings of previous studies, in that the ‘breadth’ of MNEs’ operations is positively associated with their value (Lee and Makhija, 2009a; Tang and Tikoo, 1999).

*Hypothesis 3a: The degree of the MNE’s market dependence outside South Korea will strengthen the positive relationship between the risk of war and increased sales outside the focal host country at the expense of (or decreased) sales in the focal host country.*

From the risk diversification perspective, a strategic response to the risk of war would be to minimize exposure to the host country at high risk (Benito, 1997, 2005; Van Den Bulcke, et al., 1979). Having high market dependence on countries apart from the country with a high risk of war has the equivalent meaning of being less dependent on the problematic market. Therefore, even if the risk in the host country escalates to a nontrivial degree, the overall impact it has on the MNE will likely be less important (Agmond and Lessard, 1977; Dess et al., 1995; Hisey and Caves, 1985; Rugman, 1976). In the worst-case scenario, where an actual war may break out, the resulting loss would still be regarded as minor because the MNE’s portfolio of investments already has alternative operations in the international market.

Given that high market dependence outside South Korea minimizes the overall impact of the risk of war, this larger global portfolio of investments would provide MNEs with even fewer incentives to do anything with regard to production in the host country at risk of war. More importantly, utilization of other foreign subsidiaries when dealing with risk of war in South Korea is not considered an option because other subsidiaries would be regarded as independent entities to the MNE. This is because other subsidiaries are already serving their purpose in

reducing the overall risk of the MNE (Kim, Hwang, and Burgers, 1993; Lessard, 1983; Miller and Pras, 1980). In sum, the larger the MNE's portfolio investments, the less likely the risk of war in the host country will have an impact on the MNE's remaining global production.

*Hypothesis 3b: The degree of market dependence of the MNE outside South Korea will strengthen the negative relationship between the risk of war and increased sales outside the focal host country at the expense of (or decreased) sales in the focal host country.*

## Methodology

### Data and sample

We focus on the strategic behaviors of U.S. MNEs with subsidiaries in South Korea during the period 2009-2013. Our sample of U.S. MNEs is collected through Compustat Capital IQ and Osiris databases. More specifically, we look into the geographic segment database, which provides the geographic sales information of U.S. firms. Because some firms report their geographic sales information at the regional rather than the country level, we select only those firms that specifically have sales data for South Korea. After accounting for missing values and eliminating MNEs that are not U.S. based, we are left with a final sample of 375 firm-year observations. The 5-year timeframe is specifically selected because extreme incidents (such as the bombing of Yeon-pyeong Island and the sinking of the ship Cheonan) took place within a 5-year period, thus maximally heightening the political risk in South Korea. For example, KOSPI (the Korea Composite Stock Price Index) fell 1.34% the day after the bombing incident on Yeon-pyeong Island. This particular incident also led U.S. MNEs (including Zappos.com and Groupon) to withdraw their investments from South Korea. In such a situation, it is likely the

case that MNEs will strategically react to this host country risk in order to mitigate their potential damage from certain events.<sup>3</sup>

Following the approach of previous studies, we examine all events related to North Korea in the general news section of the *Wall Street Journal* to collect news information on North Korea (Beaulieu, Cosset, and Essaddam, 2005; Chan and Wei, 1996; Kim and Mei, 2001). We use the *Wall Street Journal* because it is not only the most influential news source for practitioners, but is also widely used in academia for research. With the *Wall Street Journal*, we obtain a sample of 152 news articles during the period 2009-2013 containing negative news about North Korea. Articles were selected only if they adversely affected the South Korean economy, which would further likely result in a negative business environment in South Korea. Such news included nuclear experiments, missile shooting practice, direct bombing attacks on Yeon-pyeong Island, the bombing attack on the ship Cheonan, the North's news channel threatening the South with potential attacks, and so on. Although these impactful incidents resulted in more follow-up articles, we collect only the first article of the news because the follow-up articles generally provided redundant information that added less value in assessing the situation (Beaulieu et al., 2005; Kim and Mei, 2001). In addition, we did not use articles or columns containing subjective opinions or discussions that would not influence the overall risk of war in South Korea.

#### Measurement of variables

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<sup>3</sup> The Dow Jones index in the U.S. also experienced a 1.27% drop after the Yeon-pyeong Island incident. The interesting fact is that it actually took more time for the Dow Jones to recover from the drop, compared to KOSPI.

Dependent variable

*Operational flexibility/portfolio investment.* To assess whether U.S. MNEs choose to diversify risk or shift operations when facing the risk of war, we use a dummy variable, where 1 represents the choice of the operational flexibility strategy, whereas 0 represents the portfolio investment strategy. To determine the strategic decision of U.S. MNEs, we observe the ratio of:

$$\frac{\text{Total sales}_{t+1} - \text{South Korean sales}_{t+1}}{\text{Total sales}_t - \text{South Korean sales}_t}$$

If the ratio is bigger than 1, it implies that U.S. MNEs shifted operations from South Korea to other subsidiaries within the network of operations that the MNE possesses (Kogut and Kulatilaka, 1994; Lee and Song, 2012). This is in line with predictions involving the operational flexibility perspective. On the other hand, if the ratio is smaller than or equal to 1, we assume that the U.S. MNEs did not exercise operational flexibility, thus implying that the firms approached the matter with a portfolio investment strategy. This approach is reasonable because from a portfolio investment perspective, all subsidiaries are independent of one another, and thus, the risk of war in South Korea would not significantly affect operations in other foreign subsidiaries.<sup>4</sup>

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<sup>4</sup> The main idea of operational flexibility is that MNEs shift their operations or inputs across borders. If such shifts take place, the changes should be observable in terms of the production volume of the locations. While the assumption here is that production will naturally convert to sales in the given location, this assumption is not far-fetched in that MNEs would want their production and sales to take place in the same location in order to reduce further shifting costs. With the portfolio investment approach, minimizing operations will be best observed in terms of production or sales when MNEs do not consider market exit. As a result, if we maintain the view that production will not be unrelated with sales, the sales may well represent our theoretical approaches of operational flexibility and portfolio investment.



We would further like to note that while both perspectives anticipate a decrease in South Korean sales when MNEs are faced with the risk of war, the degree would be much greater in the case of operational flexibility because the ultimate goal of operational flexibility is to grant U.S. MNEs the flexibility to deal with host country risks whenever necessary. Thus, in an extreme case, the U.S. MNE may shift the entire operations outside South Korea and restore them back when the risk of war is resolved. This notion supports our operationalization in that exercising operational flexibility will result in a ratio bigger than 1. Comparatively, from the portfolio investment approach, the decrease in South Korean sales would be lesser in degree because the U.S. MNE is not able to respond as flexibly as it would like. Therefore, we take a conservative approach by asserting that a ratio equal to or smaller than 1 represents a portfolio investment strategy when considering that South Korean sales are also predicted to decrease with the portfolio investment approach.

#### Independent variables

*Risk of war.* Due to our objective in measuring the risk of war coming from North Korea, we count the number of negative news articles regarding North Korea using the *Wall Street Journal*. Within the timeframe of 2009-2013, for each year we search news articles with the keyword 'North Korea' and assess whether an event relating to North Korea brings about a negative impact on the South Korean economy. More importantly, we consider whether the news brings about potential obstacles and difficulties for U.S. MNEs operating within South Korea. For example, we assessed whether North Korean news (such as nuclear experiments, missile shootings, and direct attacks or threats to South Korea) would negatively impact U.S. MNEs' evaluation regarding the potential growth or stability of the operating environment within the

country. This would in turn lead U.S. MNEs to consider their use of operational flexibility or portfolio investment strategies as a means of risk management. We obtain 41 negative news articles for 2009, 61 for 2010, 14 for 2011, 7 for 2012, and 29 for 2013, respectively.

*Wholly owned/joint venture.* Whether the U.S. MNEs' subsidiaries in South Korea were wholly owned or in the form of a joint venture was coded as 1 for wholly owned, and 0 for a joint venture. Following previous studies, we considered a subsidiary to be wholly owned if the MNE held 95% or more equity share ownership of the subsidiary (Hennart, 1991; Yiu and Makino, 2002). We obtained information on the subsidiaries from a variety of sources. To check the history of joint ventures and M&As (merger and acquisitions), we went through SDC Platinum to confirm U.S. MNEs' original mode of entry. We used LexisNexis to gather information to verify the information about each MNE, and KisValue was used for MNEs that had gone public in South Korea. Exhibit 21 in the 10-k forms from the Securities and Exchange Commission was used as a supplementary check as well.

*Market dependence outside South Korea.* We operationalize the MNEs' market dependence outside South Korea by using a modified ratio of foreign sales to total sales. While past literature has used the measure of foreign sales to total sales when capturing the degree of breadth involving MNEs' global operations (Capar and Kotabe, 2003; Carpenter and Sanders, 2004; Li and Qian, 2005), we further exclude South Korean sales from foreign sales. By doing so, our measure becomes robust in representing the strategic capacity of U.S. MNEs existing outside the host country with high risk. Thus, our final measure is operationalized as:

$$\text{Market dependence outside South Korea} = \frac{\text{All foreign sales} - \text{South Korean sales}}{\text{Total sales}}$$

## Control variables

We control for *firm age*, which is computed as the natural log of the number of years since the U.S. MNE's founding year in a given year. Large firms naturally have more resources and financial/human capital available when selecting a strategic decision to their benefit. Accordingly, we control for *firm size*, which is measured as the natural log of a firm's total assets in a given year. Previous performance can influence strategic decisions in foreign markets, given that the performance itself may determine the level of the firm's resource constraints (Ellstrand et al., 2002). To control for *firm performance*, we include the market-to-book ratio (the market value of the share divided by the book value of the share).

The strategic decision to diversify or shift operations may also be affected by a firm's organizational resource availability. The current ratio (current assets to current liabilities) is included to account for *organizational slack*. Firms' *financial leverage* is also controlled, which is measured as a debt-to-equity ratio. We control for the *number of countries* in which each U.S. MNE operates, which may influence the strategic choice between the operational flexibility strategy and the portfolio investment strategy of U.S. MNEs. Given that our moderators of interest, *wholly owned* and *market dependence outside South Korea*, are expected to influence MNEs' risk management strategies, we include these as control variables in all of our models.

In order to capture the MNEs' purpose of entry into South Korea, we use the *output* and *input* variables from the offshoring database available at the Hoberg and Moon data library (Hoberg and Moon, 2017). The variables are count variables that represent offshoring activities of the firm, collected by using a text-analysis of firms' 10-k reports. More specifically, offshoring activities are identified by analyzing and counting the number of the nearest neighbor

words of countries within a 25-word window. For example, output may include words such as “Sales”, “Distribute”, “Wholesale”, while input may include words such as “Manufacturing”, “Production”, and “Factory”. Therefore, a high value of the output variable reflects a strong intention of the MNE in generating local sales, while the input variable entails the purpose of production in the country. The offshoring database reaches back to 1997, and we include the first observed value of *output* and *input* for each firm to capture the purpose of entry of MNEs.

Given that MNEs can change the original purpose at the time investment, it is important to control for the purpose of each subsidiary at a given time. For example, when Xerox first entered Japan in 1962, their main intention was focused on generating sales. However later on, the Japanese subsidiary transformed into a R&D hub, leading the Xerox’s technological innovations (Chaudoin, 1991). Fila is an example where the subsidiary actually ended up acquiring the firm itself<sup>5</sup>. Such changes in purposes of the subsidiary may eventually lead to changes in the subsidiary’s ownership structure or the market dependence on the particular country of the MNE.

We also control for the initial strategic response of the MNEs by including the variable *initial response*, which is a dummy variable that identifies the initial strategic choice of U.S. MNEs in South Korea. This variable is measured in the same way as the dependent variable (a dummy variable: 1 if the operational flexibility strategy, and 0 if the portfolio investment strategy). Because the geographic segments data in Compustat are available from 1998, we identify the MNEs’ initial response, starting from 1998. This may not be a major concern

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<sup>5</sup> *Business Wire*. 2007. Fila Korea Closes Acquisition of Fila, March 30, 2007. <https://www.businesswire.com/news/home/20070330005505/en/Fila-Korea-Closes-Acquisition-Fila>

because (1) FDI in Asian countries increased significantly shortly after the Asian economic crisis in 1997 (Peng, Lee, and Tan, 2001) and (2) globalization of the South Korean market gained momentum starting from 1993, as President Young-Sam Kim declared that there would no longer be protection for South Korean firms against foreign MNEs (Kim, Hoskisson, and Lee, 2015).

At the macro level, the *GDP growth rate* could affect MNEs' strategic decisions. If the host country market is showing high growth potential, it will be better for MNEs to exercise operational flexibility so as to benefit from the high demand growth in the market whenever necessary. We control for *market competition* by including a measure of *cr3*, which represents the market share of the three largest firms in a particular industry. This measure is obtained from the Report on Mining and Manufacturing Survey conducted by the Fair Trade Commission of Korea. We control for the foreign *exchange rate*, which is measured as the average exchange rate for a given year; the Korean Bank provides the data.

We must note that our variables of *GDP growth rate* and *exchange rate* cannot be simultaneously included in the model with the year-dummy variables: while the variables *GDP growth rate* and *exchange rate* only vary from year to year, they are, in fact, highly correlated with the year-dummy variables because they encompass macroeconomic factors that are naturally correlated. In order to check whether the effects of the year dummies are captured by the variables of *GDP growth rate* and *exchange rate*, we run additional regression models by substituting each variable with year-dummy variables, respectively. The results of the regression models for both variables show similar results when they are included instead of year-dummy variables, and when they are substituted by the year-dummy variables. Finally, we include

*industry dummies* to control for any unobserved heterogeneities arising from industry differences.

Analyses: Bivariate probit model

Given that our dependent variable, *operational flexibility/portfolio investment*, is a binary variable, a probit model may seem most appropriate as our empirical model. However, there exists the possibility that the risk of war in a host country may influence the ownership structure of the subsidiary when the MNE is making entry, thus suggesting that our variable *wholly owned* may be endogenous. In order to alleviate such concerns, we use the bivariate probit model to test our hypotheses (Wooldridge, 2002). The bivariate probit model best represents our empirical interest, given that our dependent and endogenous variable of *wholly owned* is dichotomous in nature, which would violate the key assumptions of alternative models, such as the instrumental variable (IV) probit model. The bivariate probit model jointly estimates the maximum likelihood estimates of two seemingly unrelated equations and has been used in previous studies to deal with endogeneity issues similar to the current study (Özcan and Reichstein, 2009; Park and Steensma, 2012). We run the model by using the *biprobit* command in STATA 16.

The instrument we use in our model is *industry-average wholly owned*, which is an industry-level ratio variable that captures the average ownership structure of MNEs with two-digit SIC codes. We believe this variable represents an appropriate instrument for our model in that (a) the industry level of the ownership structure is likely to affect the focal MNE's choice of ownership structure in South Korea, and (b) it is unlikely to affect MNEs' risk management strategy choice. Supporting our rationale, when *industry-average wholly owned* is regressed on

*operational flexibility/portfolio investment*, the p-value is 0.398, indicating a nonsignificant association. Thus, our instrument is expected to influence the dependent variable through the endogenous variable. The instrumental variable is included in the *wholly owned* regression, but not in the *operational flexibility/portfolio investment* regression. Put simply, the bivariate probit model involves two equations:

$$y_1 = \gamma_2\beta_1 + x\beta_2 + \varepsilon_1$$

$$y_2 = z\beta_3 + \varepsilon_2$$

where  $y_1$  is the dependent variable of interest (operational flexibility/portfolio investment),  $y_2$  is the endogenous variable (wholly owned/joint venture),  $x$  denotes the explanatory and control variables, and  $z$  is the explanatory, control, and instrumental variables for the selection model. Due to space limitations, the model showing the propensity of choosing a wholly owned subsidiary over a joint venture is only reported for the initial model (Model 1 is the selection model for Model 2, which is the model of interest of this study) in Table 2. The results of the selection models remain qualitatively similar throughout the remaining models.

## Results

Table 10 shows the means, standard deviations, and correlation coefficients for all study variables. The correlations among the variables do not seem to be problematic, and the mean variance inflation factor (VIF) score for all variables is 1.40, which is far below the recommended threshold score of 10. Further, the VIF values for each variable are below 2.69, indicating that multicollinearity is not an issue.

Table 10. Means, standard deviations and correlation among variables

Variable	1	2	3	4	5	6
1 Operational flexibility/ Portfolio investment	1.00					
2 Risk of war	-0.19	1.00				
3 Wholly owned (dummy)	-0.03	-0.02	1.00			
4 Market dependence outside SK	-0.04	0.02	-0.01	1.00		
5 Firm age	-0.02	-0.02	-0.14	-0.01	1.00	
6 Firm size	-0.02	-0.09	-0.13	-0.03	0.30	1.00
7 Performance	-0.15	0.09	-0.04	-0.00	0.00	0.00
8 Organizational slack	0.06	0.01	0.08	0.08	-0.05	-0.05
9 Financial leverage	-0.07	-0.02	-0.03	-0.08	0.03	0.14
10 Number of countries	0.04	0.05	-0.07	-0.05	0.17	0.15
11 Output	0.01	-0.01	0.03	0.16	-0.00	-0.18
12 Input	-0.04	0.00	-0.24	0.03	0.09	0.02
13 Initial response	0.02	-0.01	0.06	0.16	0.14	0.08
14 GDP growth	0.00	0.51	0.00	0.04	-0.00	-0.02
15 Market competition	0.04	0.00	0.02	0.26	-0.06	0.17
16 Exchange rate	-0.05	0.11	-0.04	-0.01	-0.01	-0.06
17 Industry average WOS/JV	-0.02	-0.02	0.40	-0.05	-0.07	-0.05

Variable	7	8	9	10	11	12
7 Performance	1.00					
8 Organizational slack	-0.00	1.00				
9 Financial leverage	0.25	0.00	1.00			
10 Number of countries	-0.08	-0.11	0.03	1.00		
11 Output	-0.07	-0.03	-0.02	-0.10	1.00	
12 Input	-0.00	0.01	0.01	-0.12	0.33	1.00
13 Initial response	0.06	-0.06	0.03	-0.00	0.16	0.06
14 GDP growth	0.08	0.05	0.05	0.01	-0.01	-0.01
15 Market competition	-0.03	-0.07	0.06	-0.10	-0.15	-0.10
16 Exchange rate	-0.03	-0.02	-0.08	0.05	0.01	0.02
17 Industry average WOS/JV	-0.04	-0.00	-0.05	-0.21	-0.04	-0.04

Variable	13	14	15	16	17
13 Initial response	1.00				
14 GDP growth	-0.00	1.00			
15 Market competition	-0.05	-0.01	1.00		
16 Exchange rate	-0.01	-0.52	0.04	1.00	
17 Industry average WOS/JV	-0.07	-0.01	-0.00	-0.05	1.00

Note: Correlations  $\geq |0.12|$  are significant at the  $p < 0.05$  level.



Table 11 reports the results of the bivariate probit regression models, with the risk management strategy as the dependent variable. Model 1 shows the results of the probit model for the propensity of MNEs' choosing a wholly owned subsidiary over a joint venture. Models 2-6 represent the model of interest, where the control variables firm age, firm size, firm performance, organizational slack, financial leverage, number of countries, initial response, GDP growth, market competition, and the exchange rate are included in Model 2. In Model 3, the independent variable, risk of war, is entered in the regression model. Models 4 and 5 test the interaction effect of a wholly owned subsidiary/joint venture and market dependence outside South Korea, respectively, and Model 6 shows the full model, including all variables.

Hypothesis 1a argues that the risk of war will be positively associated with U.S. MNEs' decision to exercise operational flexibility, while hypothesis 1b counters that the risk of war will be positively associated with U.S. MNEs' decision to diversify risk through the portfolio investment strategy. In Model 3, the coefficient for the risk of war is negative and significant ( $\beta = -0.022, p < 0.001$ ), thus showing strong support for hypothesis 1b. Therefore, U.S. MNEs are more likely to adopt the portfolio investment approach as a risk management strategy when facing the risk of war in South Korea. Hypothesis 2a predicts that U.S. MNEs with wholly owned subsidiaries rather than joint ventures in South Korea will be more likely to strengthen their use of the operational flexibility strategy when facing the risk of war, whereas hypothesis 2b predicts that U.S. MNEs will reduce the portfolio investment strategy in the same situation. Model 4 shows that the moderating effect involving the risk of war on a wholly owned subsidiary/joint venture is insignificant ( $\beta = 0.006, n.s.$ ). Figure 2 graphically visualizes the

moderating effect and shows that there is no significant difference between the slopes. Therefore, neither hypothesis 2a nor 2b is supported.

Model 5 shows support for hypothesis 3a. In hypothesis 3a, we proposed that U.S. MNEs with higher market dependence outside South Korea are more likely to strengthen their use of the operational flexibility strategy when facing the risk of war, whereas hypothesis 3b predicts that U.S. MNEs with higher market dependence outside South Korea will weaken their use of the portfolio investment strategy. The coefficient of the interaction term between the risk of war and market dependence outside South Korea in Model 4 is positive and significant ( $\beta = 0.046, p < 0.05$ ), thus providing support for hypothesis 3a. Consequently, U.S. MNEs with higher market dependence outside South Korea are more likely to adopt the operational flexibility approach when facing the risk of war in the host country. Figure 3 visualizes the empirical results for hypothesis 3a.

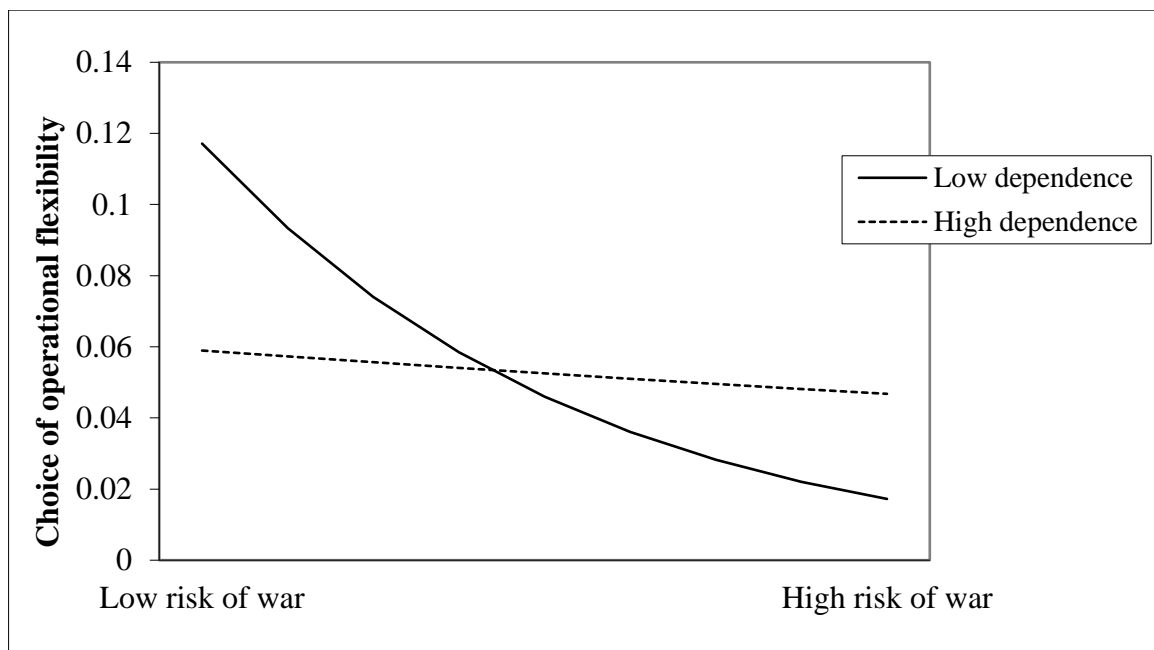


Figure 3. Interaction effect of the risk of war and market dependence outside South Korea (H3)

Table 11. Results of the bivariate probit regression analysis

Variables	Propensity of wholly owned		Operational flexibility/Portfolio investment			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Risk of war (H1)			-0.022*** (0.005)	-0.027*** (0.009)	-0.051*** (0.014)	-0.057*** (0.016)
Wholly owned		-1.074† (0.580)	-1.186† (0.626)	-1.332* (0.636)	-1.028† (0.583)	-1.221* (0.621)
Risk of war × Wholly owned (H2)				0.006 (0.009)		0.007 (0.009)
Market dependence outside SK	-0.227 (0.483)	-0.304 (0.564)	-0.092 (0.577)	-0.078 (0.579)	-1.250 (0.785)	-1.253 (0.785)
Risk of war × Market dependence outside SK (H3)					0.045* (0.020)	0.045* (0.020)
Industry-average wholly owned	5.042*** (0.766)					
Firm age	-0.255† (0.138)	-0.095 (0.162)	-0.107 (0.163)	-0.101 (0.164)	-0.104 (0.167)	-0.099 (0.167)
Firm size	-0.060 (0.066)	-0.068 (0.070)	-0.081 (0.072)	-0.083 (0.072)	-0.093 (0.074)	-0.096 (0.074)
Firm performance	0.011 (0.034)	-0.066† (0.034)	-0.050 (0.037)	-0.050 (0.037)	-0.041 (0.050)	-0.041 (0.051)
Organizational slack	0.052† (0.028)	0.027 (0.016)	0.027† (0.016)	0.027† (0.016)	0.025 (0.017)	0.025 (0.017)
Financial leverage	-0.030 (0.043)	-0.018 (0.017)	-0.025 (0.029)	-0.025 (0.029)	-0.036 (0.059)	-0.038 (0.060)
Number of countries	0.028 (0.021)	0.052* (0.023)	0.053* (0.023)	0.053* (0.023)	0.053* (0.024)	0.053* (0.024)
Output	0.016 (0.018)	0.001 (0.015)	-0.000 (0.016)	-0.000 (0.016)	-0.002 (0.016)	-0.003 (0.016)
Input	-0.050*** (0.012)	-0.019 (0.015)	-0.021 (0.016)	-0.021 (0.016)	-0.017 (0.016)	-0.017 (0.016)
Initial response	0.830*** (0.268)	0.231 (0.232)	0.279 (0.237)	0.283 (0.237)	0.297 (0.240)	0.303 (0.240)
GDP growth	-0.011 (0.056)	-0.004 (0.045)	0.169** (0.063)	0.170** (0.063)	0.165** (0.063)	0.166** (0.063)
Market competition	0.002 (0.005)	-0.002 (0.016)	0.009 (0.016)	0.011 (0.016)	0.019 (0.017)	0.021 (0.018)
Exchange rate	-0.002 (0.003)	-0.003 (0.002)	0.002 (0.003)	0.002 (0.003)	0.001 (0.003)	0.001 (0.003)
Constant	-0.128 (3.453)	4.957 (3.117)	-1.632 (3.647)	-1.666 (3.653)	-1.451 (3.709)	-1.444 (3.715)
Industry dummies	Included	Included	Included	Included	Included	Included
Observations	375	375	375	375	375	375
Wald chi square		111.38***	128.20***	127.35***	128.88***	128.92***

Note: †  $p < 0.1$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

### Supplementary analyses

The four countries of South Korea, Taiwan, Singapore, and Hong Kong are commonly

referred to as the ‘Four Asian Dragons’ due to their similarity in rapid industrialization and growth between the early 1960s and 1990s. Therefore, they are shown to be affected analogously by external influences, such as the 1997 Asian financial crisis; thus, they provide an excellent economic comparison setting to South Korea. Based on this fact, we create a comparison group of U.S. MNEs with operations in any one of the countries of Taiwan, Singapore, Hong Kong. However, the concept of the ‘Asian Dragons’ may have become relatively outdated since the 1990s. Therefore, we further include U.S. MNEs with operations in Japan in our comparison group. Based on a total sample of 408 firm-year observations of U.S. MNE operations in Taiwan, Singapore, Hong Kong, and Japan (but not in South Korea), we check whether the risk of war in South Korea affects the strategic risk management of U.S. MNEs by running the identical regression model for the comparison group. The results in Table 12 show that those MNEs with operations in Taiwan, Singapore, Hong Kong or Japan are largely unaffected by the risk of war in South Korea. Therefore, we conclude that the risk of war is an actual threat to U.S. MNEs with operations in South Korea, demanding strategic responses to deal with this risk.

Table 12. Random-effects logistic regression results table (comparison group of Japan and Asian dragons: Taiwan, Singapore, and Hong Kong)<sup>6</sup>

Variables	Model 1	Model 2
Risk of war		0.002 (0.015)
Firm age	0.087 (0.205)	0.087 (0.205)
Firm size	-0.210* (0.081)	-0.210* (0.081)
Firm performance	0.021	0.021

<sup>6</sup> Despite our endeavors to rule out alternative explanations, we must advise the readers to approach the findings with caution in that there may still exist underlying macro factors influencing the results of the comparison group.

Table 12, continued

	(0.018)	(0.018)
Organizational slack	0.018	0.018
	(0.024)	(0.024)
Financial leverage	-0.144	-0.144
	(0.170)	(0.170)
Number of countries	-0.079	-0.079
	(0.075)	(0.075)
GDP growth	0.028	0.028
	(0.078)	(0.078)
Exchange rate	-0.002	-0.002
	(0.003)	(0.003)
Constant	1.790	1.731
	(1.587)	(1.571)
Year dummies	Included	Included
Industry dummies	Included	Included
Country dummies	Included	Included
Observations	408	408
Number of firms	118	118
Wald chi square	34.20	34.20

Note: †  $p < 0.1$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

MNEs entering the South Korean market may be systematically different from those that choose not to, suggesting a self-selection issue in our sample. In order to alleviate such concerns, we conducted Heckman's (1979) two-stage model by producing a sample of MNEs from Compustat that have sales presence in Asia. In the first stage we estimate the selection model with the dependent variable as whether the MNE has presence in South Korea or not. In the second stage, we estimate the strategic choice of the MNE in terms of risk management, whether operational flexibility or portfolio management, which is the main model of interest. We utilize the *heckprobit* command in STATA 16 in order to run the Heckman two-stage model. The Heckman's model requires including a variable in the selection model that is not included in the second stage model. We therefore include the *Asian dragons* variable, which is a dummy

variable whether the MNE also has presence in the other Asian dragon countries (Hong Kong, Taiwan, and Singapore) as well as in Japan, since those MNEs are also likely to invest in South Korea that is comparable in terms of economic environment and opportunities. We find that this variable is strongly related to a MNE's likelihood of entering the South Korean market in the selection model. More importantly, we find that our main results remain consistently significant in the Heckman two-stage model as with our bivariate probit model, providing stronger support to our empirical findings.

Table 13. Results of Heckman two-stage regression analysis

Variables	First stage selection equation (DV: Entry into South Korea dummy)		Second stage outcome equations (DV: Operational flexibility or portfolio investment)			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Risk of war (H1)			-0.023*** (0.005)	-0.027** (0.009)	-0.050*** (0.013)	-0.054*** (0.015)
Wholly owned		-0.408 (0.267)	-0.468† (0.272)	-0.640 (0.401)	-0.455† (0.274)	-0.630 (0.399)
Risk of war × Wholly owned (H2)				0.004 (0.007)		0.004 (0.007)
Foreign market dependence		-0.250 (0.576)	-0.018 (0.591)	-0.007 (0.591)	-1.077 (0.753)	-1.068 (0.753)
Risk of war × Foreign market dependence (H3)					0.036* (0.015)	0.036* (0.015)
Asian dragons	1.201*** (0.107)					
Firm age	-0.330*** (0.023)	-0.044 (0.167)	-0.060 (0.169)	-0.058 (0.169)	-0.073 (0.170)	-0.072 (0.170)
Firm size	0.202*** (0.034)	-0.077 (0.074)	-0.087 (0.076)	-0.088 (0.076)	-0.097 (0.077)	-0.099 (0.077)
Firm performance	-0.000 (0.003)	-0.065† (0.035)	-0.049 (0.037)	-0.048 (0.037)	-0.037 (0.051)	-0.037 (0.051)
Organizational slack	0.027*** (0.005)	0.023 (0.016)	0.024 (0.015)	0.024 (0.016)	0.022 (0.016)	0.023 (0.016)
Financial leverage	-0.002 (0.004)	-0.018 (0.016)	-0.024 (0.026)	-0.025 (0.026)	-0.035 (0.059)	-0.036 (0.060)
Number of countries	0.170*** (0.017)	0.050† (0.029)	0.054† (0.030)	0.055† (0.030)	0.057† (0.030)	0.057† (0.030)
Output		-0.002 (0.015)	-0.004 (0.015)	-0.005 (0.015)	-0.007 (0.015)	-0.007 (0.015)
Input		-0.010 (0.015)	-0.012 (0.015)	-0.012 (0.015)	-0.009 (0.015)	-0.009 (0.015)
Initial response		0.192 (0.231)	0.238 (0.236)	0.245 (0.236)	0.272 (0.239)	0.279 (0.240)
GDP growth		-0.001	0.179**	0.172**	0.133*	0.126†

Table 13, continued

		(0.046)	(0.063)	(0.064)	(0.067)	(0.068)
Market competition		-0.006	0.005	0.006	0.015	0.017
		(0.016)	(0.017)	(0.017)	(0.018)	(0.018)
Exchange rate		-0.003	0.002	0.002	0.000	-0.000
		(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
Constant	-2.050***	4.426	-2.506	-2.148	-0.365	0.009
	(0.218)	(3.172)	(3.677)	(3.732)	(3.853)	(3.906)
Industry dummies	Included	Included	Included	Included	Included	Included
Observations	2,493	375	375	375	375	375
Wald chi square		32.54	47.65	47.58	51.10	51.33

Note: †  $p < 0.1$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ , Inverse Mills ratio is not reported in the table because the heckprobit command in STATA estimates the model through maximum likelihood and therefore does not explicitly use the inverse Mills ratio correction.

During our study timeframe, North Korea underwent a regime change resulting from the death of the former leader, Jong-Il Kim, in 2011. To stabilize the regime, the successor, Jong-Un Kim, implemented increased aggressive actions toward South Korea, often resulting in violence. To further account for the variation in time due to *regime change*, we include a dummy variable with a value of 1 if the given year is before 2012 instead of year dummies in an additional analysis. Although not reported, the result is not significantly different from that of the case when year dummies are included.

## Discussion

Our study observes how U.S. MNEs manage host country risk, i.e., the risk of war in South Korea, by comparing two perspectives, namely operational flexibility and portfolio investment, which provide divergent predictions in terms of risk management. Our results suggest that U.S. MNEs are more likely to approach the risk of war with a portfolio investment strategy, thereby reducing their exposure to such a risk. However, we find that U.S. MNEs that are more dependent on foreign markets other than South Korea tend to reduce their usage of the

portfolio investment strategy and instead utilize their global networks of subsidiaries by shifting operations across borders.

This study broadly contributes to the literature of international risk management. While Miller (1992) proposes a framework of risk management that includes firms' avoidance, control, cooperation, and flexibility responses, our study indicates that MNEs respond to host country risks by interchangeably leveraging risk management strategies. More specifically, based on our results, MNEs may utilize their flexibility or avoid exposure to the risk of war, depending on the characteristics of their global operations. It is therefore important to acknowledge the fact that MNEs respond to risks in multiple ways, making it imperative that we explore when and how MNEs choose to engage in diverse risk management strategies.

Our study also contributes to the operational flexibility and portfolio investment literatures by highlighting their different approaches in utilizing foreign subsidiaries when facing the risk of war in a host country. According to our study, the link between the two may be the market dependence of the MNE located outside the host country at risk. While this contrasting view of the two perspectives has been acknowledged in prior studies (Kogut and Kulatilaka, 1994), little empirical work has been done in the international business literature. By directly comparing operational flexibility and portfolio investment strategies, this research echoes recent studies that call for an examination of the specific contexts that show when either strategy may become dominant over the other (Belderbos et al., 2020).

In addition, while our study does not directly address the motivation of MNE internationalization itself, it touches on how MNEs invest in foreign countries with substantial risk, such as the risk of war. Contrary to what one might expect, MNEs continue to invest in



locations with host country risks if the given opportunities outweigh the costs. South Korea is a good example: MNEs seek to pursue profit in the 12<sup>th</sup> largest economy in the world, despite the risk of war. The results of our study suggest that while MNEs may consider the portfolio investment strategy when investing in foreign operations (with respect to risk management), the motivation for further internationalization seems to weigh more on operational flexibility as the MNE's degree of market dependence outside the host country at risk increases.

It is important to acknowledge the limitations of this study, which may simultaneously be recognized as opportunities for future research. Our results show no support for our hypotheses regarding the relationship between the ownership structure of the subsidiary in the host country and the MNE's strategic choice. This may be because while ownership of the subsidiary may grant strategic autonomy, it is also associated with significant cost of the MNE (Tong and Reuer, 2007). In addition, there may be other intentions involved, where partial ownership may represent more growth opportunities in the host country as opposed to operational flexibility. While this nonsignificant result is interesting, we believe this finding actually highlights the fact that MNEs tend to consider the configuration of the whole network of subsidiaries in terms of dealing with a host country's risk (Belderbos, et al., 2020; Fisch and Zschoche, 2012), rather than focusing on the characteristics of the individual subsidiary in question. This finding is further supported by the fact that MNEs shift their strategic choice from portfolio investment to operational flexibility as their entire operation becomes more globalized. Future studies may observe how the entire ownership structure of each subsidiary in the MNE's global network affects the risk management strategy of the MNE, rather than focusing on the single ownership structure of the subsidiary in the country at risk.

The current study is confined to the South Korean context, which may bring about concerns of generalizability. However, the potential negative consequences of war are universally damaging for MNEs, regardless of the location. Thus, scholars may extend the scope of the current study by examining how MNEs deal with the risk of war in different contexts. For example, the persisting clash between China and Taiwan or the recent border conflict between China and India may provide new insights with respect to how regional conflict influences firm behaviors. Additional related questions may include the following: how do wars that occur frequently differ from the risk of war, which is unquestionably present, yet has not been realized? Would there be an asymmetric relationship in that MNEs from developing economies respond differently to military violence in developed economies? If the MNE's home country were already experiencing the risk of violence, would it affect their behaviors in host countries with similar risks? How would MNEs deal with the risk of war before entering the host country (e.g., entry mode, initial commitment of resources)? We believe that connecting the above questions with different methodological approaches, such as event studies or qualitative research, may further enhance our understanding of how the risk of war influences MNEs' strategic behaviors.

Last but not least, our study provides insightful implications for practitioners. MNEs must pay attention to many different types of political risks, and the risk of war is one of them. While the risk of war may pose serious concerns involving the sustainability of operations in the country, exiting the country may not be the only option for MNEs, especially when the host country market poses opportunities to the firm. Through our study, we suggest to managers that they actually have alternative strategies to deal with the risk of war, either by shifting operations to other subsidiaries, or by minimizing exposure to the particular risk. Our findings further suggest

that one deciding factor to consider would be how large the MNE's operations are outside the country with the risk of war. In sum, we urge the managers of MNEs to have a clear understanding of their subsidiary networks, which will enable them to deal better with the risk of war. MNEs may benefit even further if they are able to incorporate such strategic considerations into their decision-making processes before entering host countries with prevailing risk of war.

### Conclusions

We began this article by exploring the seemingly contradictory predictions of real options theory and risk diversification theory in terms of how MNEs utilize their global networks of operations with respect to dealing with host country risks. Given that MNEs face various host country risks around the globe, a comprehensive understanding of how MNEs deal with severe threats, such as the risk of war in a host country, is not complete without consolidating multiple strategic perspectives. In this paper, we examined how MNEs initially implement portfolio investment rather than operational flexibility when facing the risk of war in a host country. However, MNEs tend to shift more toward exercising operational flexibility as they have more foreign markets that are available other than the host country at risk. In conclusion, if this paper could contain only one message, we would like it to be that the risk management strategies of MNEs are complex. MNEs may respond to host country risks using differing strategies, depending on the characteristics of the MNE, such as the configuration of its subsidiary network. In the current era of globalization, MNEs face various host country risks in diverse contexts. We hope that our paper will prompt future research to further explore how MNEs develop and implement diverse ways of managing host country risks.

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#### PAPERS UNDER REVIEW (titles abbreviated)

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Liu, Y., Yeo, Y. D., & Park, H. D. Performance feedback, deadline proximity, and VC investment.

- Revising after Reject and Resubmit at *Strategic Management Journal*

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Liu, Y., **Yeo, Y. D.**, & Park, H. D. Performance feedback, deadline proximity, and venture capital investment behavior.

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- 2021: *Academy of Management Annual Meeting*, Virtual.

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