# MULTINATIONAL STRATEGIES AS OPTIONS CREATION AND EXERCISE: AN ANALYSIS OF COUNTRY, INDUSTRY, AND FIRM SPECIFIC CHARACTERISTICS

by

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DEDICATION

To my parents, Pokkrong and Sanuachit Rittippant, and my husband, Tawan Boonyawat

for their tremendous support and sacrifice.

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ABSTRACT

MULTINATIONAL STRATEGIES AS OPTIONS CREATION AND EXERCISE: AN ANALYSIS OF COUNTRY, INDUSTRY, AND FIRM SPECIFIC CHARACTERISTICS

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This study investigates international expansion strategies using a real options framework. Decisions to enter foreign markets and their subsequent decision to increase, delay or abandon their commitments are both predicted and evaluated from an options perspective. More specifically, this study attempts to answer the following two questions: (i) How do macro-environmental, industry and firm specific factors impact the real option process of a multinational enterprise (MNE)? (ii) How does the market react to the different option choices?

The real options process from the creation of an option to its subsequent exercise was examined along with market reactions following the announcements of

these events. The direct and moderating effects of country, industry, and firm specific characteristics were proposed and tested.

A sample of 281 international investment announcements and 281 subsequent announcements of further actions was collected from 46 MNEs in the Securities Exchange of Thailand from 1995-2005. The findings indicate that host-country economic growth rate and economic freedom, home-country industry competition, and firm's ownership concentration have significant impacts on the decision to expand the initial investments. Furthermore, initial investment announcements in the form of joint ventures were found to have significant positive market reactions. Interestingly, wholly-owned initial investment announcements were found to have significant negative market reactions. While there was no significant positive market reactions to growth option announcements, delay and exit option announcements were found to have significant negative market reactions as hypothesized. The proposed contextual factors did not yield significant moderating effects on the relationship between options exercise and market valuation. However, supplementary analysis showed significant moderating effects of home-industry competition and executive positions on the relationship between the initial joint venture announcements and market valuation. The results of this study provide evidence of the appropriateness of the real options as a useful perspective for studying international expansion strategies.

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# CHAPTER I

# INTRODUCTION

In the modern era of globalization, firms face an increasingly dynamic and competitive environment. Researchers look for ways to explain the effects of environmental changes on corporate strategy and how firms should cope with an increasing level of uncertainty (Brown & Eisenhardt, 1998; Rosenberger & Eisenhardt, 2003). This stream of research focuses on organizational strategy that is appropriate in a rapidly changing environment (Adner & Levinthal, 2002; Miller & Arikan, 2004, Luehrman, 1998a, 1998b).

The real options approach to strategic decisions is capturing the interest of strategic management researchers and practitioners due to its ability to keep alternatives open while simultaneously limiting resource commitments (Amram & Kulatilaka, 1998; Dixit & Pindyck, 1994, 1995; Kogut & Kulatilaka, 2001; McGrath, 1997; Trigeorgis, 1996). A real option is similar to a financial option because it enables managers to reserve the right, not an obligation, to enter into a new investment in phases (Myers, 1977). The difference between a real option and a financial option is that a real option deals with real assets instead of financial assets. Thus, a small initial investment in real assets can lead managers to exercise a subsequent growth option if the condition is favorable. If unfavorable changes occur after the initial commitment, the manager can

choose to delay or exit out of that investment with a relatively low cost as opposed to a lump sum, non-staged investment. This flexibility is a valuable asset to the firm, especially under high uncertainty.

Recently, researchers in the management field have adapted the real options approach to explain different strategic phenomena such as joint ventures (Kogut, 1991; Reuer & Tong, 2005; Kumar, 2005) and other types of market entry strategies (Kogut & Kulatilaka, 1994; Bowman & Hurry, 1993; Lee & Makhija, 2003). However, methodologies for applying the real options approach are far less developed than traditional capital budgeting methodologies causing many firms to struggle with effectively implementing the real options approach (Bowman & Moskowitz, 2001). Despite a growing body of research, there remain some unresolved issues of what real options are and how firms can use them as tools for strategic decision making (Adner & Levinthal, 2002).

There is an ongoing debate in the management literature on the definition of real options (Adner & Levinthal, 2004a, 2004b; McGrath, Ferrier & Mendelow, 2004; Kogut & Kulatilaga, 2004; Zardkoohi, 2004). Some researchers argue that there needs to be more stringent criteria to distinguish real options from other activities (Adner & Levinthal, 2004a, 2004b). However, others argue the opposite (e.g., McGrath et al., 2004). More specifically, Adner and Levinthal (2004a, 2004b) propose that only strategic investments with an ex ante specification of rigid abandonment criteria can be classified as a real option. In contrast, McGrath et al. (2004) point out that Adner and Levinthal's (2004a) definition of real options is an abrupt departure from the existing

literature. McGrath et al. (2004) further argue for a broader definition; they argue that the only investments that do not generate future choices and do not allow preferential access to future opportunities are those that do not represent real options. It is interesting to empirically test whether the different types of investment (e.g., joint ventures, wholly-owned) would yield different outcomes in terms of a firm's value and market response to the different strategies. If a broader definition of investment as real options is valid, the different types of investments should all yield a positive response under high uncertainty conditions such as in an emerging market.

Multinational enterprises (MNEs) deal with a relatively higher level of uncertainty and changes than a pure domestic firm due to additional macro-environmental factors that can have significant impacts on these firms' strategies and performance (Hill, 2003). As such, the real options approach of wait-and-see to international investment decisions for the MNEs can add tremendous value to their strategies (Amram & Kulatilaka, 1998; Lee & Makhija, 2003; Campa, 1994). However, empirical research in this area is also minimal. Although many researchers have alluded to the need for more theoretical and empirical studies of the real option process (i.e., creating and exercising an option) and its environmental factors (e.g., McGrath et al., 2004), none of the studies, so far, have accomplished this goal.

According to Bowman and Hurry (1993), there are four strategy themes integrated by an options lens: (1) resource allocation; (2) strategic positioning; (3) sense making; and (4) learning. Resources constitute a bundle of options for strategic choices through sense-making and learning (Bowman & Hurry, 1993). According to McGrath,

et al. (2004), four real options concepts have been identified in management literature. These are: (1) options value as a component of the total value of the firm, where it represents growth opportunities (Miller & Modigliani, 1961); (2) specific investments with option-like properties; (3) choices that might pertain to one or more proposals (Trigeorgis, 1993; Adner & Levinthal, 2004a); and (4) options reasoning as a heuristic for strategy (Bowman & Hurry, 1993).

Stages of real options can be separated into two distinctive stages: 1) creating real options (i.e., options creation), and 2) exercising real options (i.e., options exercise). Creating real options involves an initial investment decision, while exercising the real options involves the second investment decision that follows the initial investment plan (Rosenberger & Eisenhardt, 2003). An initial investment, such as a firm's first market entry, can be considered the strategy of creating a real option because it enables managers to reserve the right to expand if and when the uncertainty is known to be favorable for growth. In the example of market entry, firms gain a foothold into the new market for further possible expansion if and when the external and internal conditions become suitable. The exercise of the different types of subsequent options is discussed below.

There are several types of real options that create flexibility for firms. Brach (2003) divided basic real options into six categories: 1) option to defer; 2) option to abandon; 3) option to switch; 4) option to expand/contract; 5) option to grow; and 6) option to stage. The most common forms of options are options to grow, options to delay, and options to exit, with the options to grow being the focus of most empirical

real options research (e.g., Tong & Reuer, 2004). This study will also focus on the growth options, delay options and exit options, as choices for options to exercise. These options and their differing impacts on market reactions will be empirically examined to develop a framework for appropriate options under different conditions, as determined by the market reactions.

### 1.1 Rationale of Research and Research Objectives

Drawing from the strategic management and international business literatures, this study will utilize an interdisciplinary framework to examine international investment options by multinational enterprises and their outcomes. The primary research questions focus on the conditions under which real options creation and exercise are valuable strategies to the MNE and whether the subsequent type of option can be predicted. More specifically, combinations of country-specific, industry-specific, and firm-specific factors concerning the appropriate options exercise that the MNEs should pursue, as inferred by the market reactions to these events, will be explored. Each of these factors is expected to influence the nature of the relationship between MNEs' options creation and exercise with the market valuation. A second focus of this research is to examine whether the different types of real option investments yield similar responses from the market.

Three models will be proposed to test the following three main relationships. First, a set of antecedents of the types of option exercise (growth, delay, and exit options) will be explored. Second, the relationship between the option creation and market valuation will be investigated to see whether real options creation increases

market valuation of the MNEs. The market valuation, in terms of Tobin's Q, is utilized as an indicator for investors' perception of the firm's value. This measure has been used by previous real options research (e.g., Lee & Makhija, 2003) as a proxy for market reactions to real options. Third, the relationship between the option exercise and market valuation will be examined. Comparison between the value created by the different types of options exercises (growth, delay, and exit) will be made. The effects of contextual factors at three levels: country, industry and firm, on the relationship between real options and market valuation will also be tested.

## 1.2 Importance of Research and Anticipated Contribution

Creation and exercise of options lead to changes in a firm's value and performance, which can be approximated by market reactions and Tobin's Q value. Therefore, those factors that influence the creation and exercise (or lack thereof) of options need to be studied. The goal of the present study is to identify the country-specific, industry-specific, and firm-specific contextual factors that lead to the decision to continue, delay or exit an option. This study speaks to a larger question in the international real options literature concerning the link between options creation, contextual factors, and the outcomes in terms of options exercise, and the market reactions/valuation to those outcomes.

According to McGrath et al. (2004), the link between real options, influential factors, and performance remains largely unexamined. In other words, it is important to understand how these conditions transfer into the success or failure of the options strategy as seen by the market. While an outcome, such as growth options, may appear

to have a positive connotation, the reactions to the firm's decision of the chosen options to exercise may vary, depending upon other contextual factors (Zardkoohi, 2004; Adner & Levinthal, 2004a). Consequently, the key question when evaluating the effectiveness of a chosen option may not simply be the type of options exercise, but how contextual factors influence the relationship between the chosen options exercise and market reactions. For example, if external and/or internal environment of the firm changes unfavorably from the time of the initial investment, exercising option to grow will more than likely result in a negative market reaction. In this case, the option to delay or exit may yield more positive market reactions. In examining a situation of announcements for option creations and options exercise, the intent is to shed light on a larger question in the literature. The question that researchers have debated centers on the form of an appropriate real options strategy.

In terms of the influential factors of real options model, the current literatures in both the management and international business fields lack theoretical and empirical studies on a more comprehensive model that includes the moderating effects of contextual factors, both in a firm's external and internal environments, in the real options decision process. By highlighting country-specific factors, industry-specific factors, and firm-specific factors involved in determining the options exercise, the intricacies in choosing an effective real options strategy will be examined, enabling a more fine-grained answer to the question of what influences the real options decision and outcome. The answer to this question may be that an options creation and options exercise themselves are neither bad nor good. Rather, the market reactions to a real

options decision depend on a number of factors in the situation. The key consideration when evaluating the effectiveness of an option exercise may not simply be in considering the initial options creation, but also how the contextual factors affect the market valuation of real options. Furthermore, real options researchers must not only realize the influence of variance in industry-specific and firm-specific factors, but also the constant changes in conditions which multinational enterprises encounter when doing business abroad.

In summary, the purpose of this study is to develop and test a comprehensive model of real options and the moderating effects of various contextual factors in order to understand the market reactions to multinational strategies. More specifically, the real options process from the creation of an option to the exercise of the option will be examined along with the subsequent market reactions following the announcement of these events. In addition, the contextual factors – categorized as firm-specific, industry-specific, and country-specific factors – that influence the real options process, different subsequent options to exercise, and the market reactions will be proposed and tested. The overall models for the study are captured in Figures 1 and 2.

## 1.3 Overview of Dissertation

Chapter II provides literature review on real options, the use of real options in the management and international management fields. This chapter will investigate the effects of the influential factors on the real options outcomes in the international context. Chapter III will discuss the theoretical development and hypotheses. In Chapter IV, the research design will be discussed and the proposed methods and data analysis

will be presented. Results and findings will be presented in Chapter V. Finally, Chapter VI presents a discussion of the findings, contributions to academics and practitioners, limitations of the study, and directions for future research.

# CHAPTER II

# LITERATURE REVIEW

Prior research has emphasized the need for more empirical studies on real options, a more comprehensive and testable model of real options and the real options impacts on firm's performance and value (e.g., McGrath et al., 2004; Kogut & Kulatilaka, 20004; Lee & Makhija, 2003). In general, the amount of real options research in management field has been more heavily focused on conceptual applications of real options to explain management-related issues, such as decision-making process and diversification strategies, rather than on empirical findings. Conditions for utilizing a real option strategy are characterized by antecedents such as uncertainty, irreversibility, competition, and asset value (e.g., Folta, 1998; McGrath & Nerkar, 2004; Kogut, 1991; Folta & Miller, 2002). Several influential factors on the outcome of the real options have been proposed, but they are yet to be empirically validated.

Arguments have been made in support of adoption of a real options perspective in making investment decisions. These arguments claim that real options should serve to enhance value in firm strategies and that it gives firms more flexibility (McGrath, 1998). Additionally, changes in influential factors between the real options creation and the real options exercise must be observed in order to study the options exercise decision and the market reactions to these events (Lee & Makhija, 2003). According to

the summary of recent real option research by Rosenberger and Eisenhardt (2003), there are several opportunities for further empirical research in real options. Researchers often acknowledge the importance of studying these influential factors in the real options process (Adner & Levinthal, 2004a, 2004b; McGrath et al., 2004; McGrath, 1997). Further investigation in this area will provide an insight for appropriate options to exercise in a dynamic environment, while enabling firms to be flexible and enhance value (Reuer & Leiblein, 2000). The moderating effects of relevant contextual factors for MNEs (i.e., country, industry, and firm specific factors) are, therefore, proposed as a part of the key components for succeeding in the real options execution. Moreover, most researchers, with the exception of Rosenberger and Eisenhardt (2003), have provided limited explanation for the relationship between the real options creation and the real options exercise. While the conceptual understanding of this relationship is certainly useful, it is equally important to empirically verify it.

The majority of empirical studies on options and their values have emphasized the growth options as a sign of real options success story (Folta & Miller, 2002; Tong & Reuer, 2004; Reuer & Tong, 2005). A clear alternative to growth options is an exit option that lets the right to execute the options expires or to terminate the initial plan altogether. The exit options seem to have negative connotation of failure to act upon the initially created options. However, the exit options could be an appropriate option under certain conditions. Such options can be viewed as a wise decision in the face of unexpected and/or unfavorable changes in different contextual factors between the times of options creation and options exercise. Likewise, not all growth options can be

considered wise. The growth options can add value to the firm under specific, but not all, conditions, as shown by conflicting results in the growth option studies (Miller & Leiblein, 1996; Reuer & Leiblein, 2000).

These conflicting results indirectly demonstrate support for both the growth options and the exit options (e.g., Reuer & Leiblein, 2000; Tong & Reuer, 2004; Lee & Makhija, 2003). Such conflicting findings have led researchers to suggest that there must be other factors with additional influences in determining the impact of the options creation (Adner & Levinthal, 2004a, 2004b). Many researchers mentioned that contextual factors, such as firm and industry factors, may influence the real options process, and thus, recommended future research to investigate moderating and mediating effects (McGrath, 1997; Adner & Levinthal, 2004a, 2004b; Kogut & Kulatilaka, 2004). Hence, the role of influential contextual factors should be explored as one of the key determinants of success and failure in real options strategy. The differing influence of factors both within and outside of the organization in determining appropriate real options strategy is yet to be proposed. Moreover, considerations of the market reactions on the real options process must be presented to shed more light on the real options process and its outcomes (Jagle, 1999).

Additionally, Reuer and Leiblein (2000) claimed that while real options are often used in an attempt to reduce risks by producing flexibility, such flexibility might not be present if other unexpected changes occurred. Therefore, different options to exercise should be desirable within various combinations of conditions, taking into considerations the changes in country-specific, industry-specific, and firm-specific

factors during the real options process. These findings highlight the need to stress the potential main and moderating effects of contextual factors that influence the real options process and outcomes. Clearly, the decision to expand on the initial investment is influenced by the current external and internal conditions of the firm regarding the project. These contextual variables such as the host-country conditions, competition from rival firms, and changes in firm's internal environment can alter the initial plan to grow within a certain market. While most of the existing empirical research has focused largely on determining the antecedents of real options creations and exercise, the impact of influential factors has remained largely unexamined. A central theme of the current research is the importance of both main and moderating effects of contextual factors on a real options process as indicated by the market reactions upon the options creation and exercise, as well as market valuation in term of Tobin's Q. The perceived value of outcomes may be contingent upon the types of options exercise and the conditions under which the options were being created and/or exercised.

## 2.1 Real Options in Management Literature

Real options research in management literature can be divided into five main areas: antecedents of real options, types of options, options creation, options exercise, and the effects of real options on a firm's performance.

### *2.1.1 Antecedents of Real Options*

According to Rosenberger and Eisenhardt (2003), the most common antecedents of real options in previous empirical research are uncertainty, irreversibility,

competition, and asset value. Previous empirical research examines how these variables relate to real option creation and exercise and how real options benefit organizations.

*Uncertainty* is the main reason for using real options. Firms facing uncertain environments tend to avoid making lump-sum investments. Instead, they make small investments and observe uncertainty as it unfolds (Miller and Folta, 2002). These small investments create an advantage over competitors while keeping investment risk exposure limited to the small initial investment. If the level of uncertainty decreases after an option creation, it can, then, make larger subsequent investments (Rosenberger & Eisenhardt, 2003; Folta, 1998; McGrath & Nerkar, 2004; Folta & Miller, 2002; O'Brien, Folta, & Johnson, 2003; Folta, Johnson, & O'Brien, 2001).

*Irreversibility* is the inability of firm to revert initial investments (Pindyck, 1988; Dixit and Pindyck, 1994, 1995). Irreversible investments occur in assets that are difficult to redirect. For example, specialized assets for pharmaceutical R&D are difficult to liquidatein the common market. Irreversibility is especially important when an investment's potential is declining and firms want to sever the investment. If investments in an asset are reversible, real options are not advantageous over lump-sum investments. This is so because it is less necessary to limit their initial investment exposure. Therefore, lump-sum, easy-to-reverse investments can be made.

*Competition* refers to the level of rivalry. In a more competitive setting, competitors are more likely to anticipate a firm's present options, which make it less likely that the firm's options will be exercised. Hence, it is also less likely for new

options to be created in highly competitive industries (Folta, 1998; McGrath & Nerkar, 2004; Folta and Miller, 2002).

*Asset value* refers to the value of the investment assets. A firm's reason for a real option is to realize the asset value while operating under uncertainty. According to Rosenberger and Eisenhardt (2003), there is no clear relationship between asset value and option creation for the following reason: "On one hand, an increase in the asset value will make a real option on the asset more valuable. The access to the asset provided by the option is more valuable when the asset is worth more. On the other hand, it will also make the alternative to a real option, a one-time investment, more valuable as well." Wholly-owned assets are more valuable when the assets are worth more. In the high-tech startup investment situation, the asset value is the value of the startup's proprietary technology to the larger firm. As this technology becomes more valuable, the large firm will value an initial investment in the startup more, but they will also value owning the startup more as well (Rosenberger & Eisenhardt, 2003).

Asset value has a clear relationship with the options exercise. Firms with existing real options on increasingly valuable assets will be willing to invest larger amounts to gain more access to these assets (Kogut, 1991; Folta, 1998; Folta & Miller, 2002; Kim & Kogut, 1996). In the case of a high-tech startup investment, the large firm has already invested in the startup (i.e., options creation). If the value of the technology increases, the large firm will become even more interested in the technology. Consequently, it is likely to exercise the option by acquiring the startup to secure better access to the proprietary technology.

### *2.1.2 Types of Options*

As mentioned earlier, Brach (2003) categorized real options into six basic categories: option to defer; option to abandon; option to switch; option to expand/contract; option to grow; and option to stage. The most common forms of options are options to grow, options to delay, and options to exit, with the options to grow being the focus of most empirical real options research (e.g., Kulatilaka & Perotti, 1998; Tong & Reuer, 2004). Moreover, the growth options are more extensively studied in finance literature to identify growth options value (e.g., Tong & Reuer, 2004). One study that looks at an alternative to growth options is the dual options study by Folta and O'Brien (2004). They examine option to grow and option to defer in market entry decisions. They found that the relationship between uncertainty and market entry is moderated by irreversibility which influences the option to defer, total value of growth opportunities, and early mover advantages which magnify the value of the growth options.

### *2.1.3 Options Creation*

Researchers study options creation to determine when firms will use real options instead of one-time investments. Most of these studies start by reasoning why a decision, such as market entry or international investment decision, is justified as a real option (Folta, 1998; McGrath & Nerkar, 2004). In these studies, the options creation is often their dependent variable. Many also compare and contrast options creation to inaction, and others to lump-sum investments. In addition, the studies focus on how the

antecedents – independent variables, such as uncertainty, irreversibility, competition, and asset value – affect the likelihood of option creation.

Research on options creation has been done in a wide range of areas, such as entry mode decisions in international markets (Reuer & Tong, 2005), strategies for accessing external R&D (Folta, 1998), decisions to enter new product areas (McGrath & Nerkar, 2004), and decisions to spin out tracking stocks (Raynor, 2000).

The options creation research focuses on how uncertainty, irreversibility, competition, and asset value affect the likelihood of option creation. Even though studies in this stream measure uncertainty in different ways (e.g., partner dissimilarity and market demand uncertainty), all seem to agree that more uncertainty leads to option creation (Rosenberger & Eisenhardt, 2003). Many studies, such as Folta (1998), find irreversibility to be positively related to option creation. Firms are more likely to stage investments when the invested assets are specific and difficult to reverse.

McGrath and Nerkar (2004) argue for options creation to be an inverted U-shaped function of competition. Rosenberger and Eisenhardt (2003) note that this argument is a more sophisticated argument than the strictly negative relationship suggested by Folta (1998) because it incorporates the industry investment benefit provided by low levels of competition in new markets. Nevertheless, the positively sloping section of the curve should occupy a very small portion of the function, because competitive rivalry quickly dominates the industry investment effect.

### *2.1.4 Options Exercise*

Researchers study option exercise to determine whether and when firms will exercise their existing real options (Coff & Laverty, 2001; Miller & Folta, 2002). In other words, they examine the conditions in which firms make subsequent investments. After justifying a decision as a real option, the options creation empirical studies treated the likelihood of option exercise as their dependent variable, and tested the relationships between the independent variables, such as uncertainty, competition, irreversibility and exercise costs, and the likelihood of option exercise. Within the options exercise literature, researchers have tested these relationships in the areas of acquiring/divesting manufacturing joint ventures (Kogut, 1991), follow-on equity investments in partnerships (Folta & Miller, 2002), market entry decisions (O'Brien et al., 2003; Folta et al., 2001), and product development sequencing (Kim & Kogut, 1996). According to Rosenberger and Eisenhardt (2003), the empirical findings indicate that firms exercise their existing options under conditions of declining uncertainty, increasing asset value, declining irreversibility, and declining competition.

### *2.1.5 Real Options and Performance*

This section focuses on the empirical evidence on how a firm's performance can benefit from using real options. The studies reviewed in this section have either risk exposure or organizational performance as their dependent variables and real options used as their independent variable. Researchers expect real options to lower a firm's organizational risk because option creation or the initial investments are usually smaller and give firms the flexibility over whether to commit additional resources in the future.

Researchers also expect real options to improve firm performance measures because options allow firms to increase their investments with promising prospects. The research stream on risk exposure focuses on limiting risk for international manufacturing firms (Miller & Reuer, 1998a; 1998b; Reuer & Leiblein, 2000), and the performance stream examines options in terms of diversification strategies (Raynor, 2000), patenting strategies (Levitas & Chi, 2001), and new venture valuation (McGrath & MacMillan, 2000).

The empirical research on the effects of real options on firm performance argues that in uncertain environments, firms that use real options will have more flexibility and will outperform firms that do not (Rosenberger & Eisenhardt, 2003). Previous research tests this proposition for operating performance (Raynor, 2000) and market performance (Levitas & Chi, 2001). In a study combining econometric and case-study methods, Raynor (2000) looked at the relationship between hybrid diversification (i.e., using more than one method of diversification) and firm-level performance, measured as operating return on assets. The author argues that hybrid diversification creates options on future synergies between currently unrelated businesses. He finds that firms with hybrid diversification are not at a performance disadvantage for being less focused. On the contrary, there are higher expectations placed on these types of firms in financial markets for future performance. These expectations exist in industries where options on synergies are expected to be most valuable. Thus, Raynor (2000) concludes that hybrid diversification creates options, which in turn contribute to future performance.

In another study on the effect of real options on performance, Levitas and Chi (2001) examined market reactions as a proxy for performance. They studied how technology options, measured as pharmaceutical patents, influence a firm's stock market results. The authors argue that when patents are conceptualized as technology options that can be commercialized or licensed, they are linked to market performance. The authors frame patents as options by relating them with technological uncertainty, liquid asset holdings, and capital expenditures. Liquid asset holdings and capital expenditures allow a firm to exercise options created through patents. They also find that patents relate positively to stock market performance.

In contrast to the lack of support for the research on organizational risk, the research on the relationship between real options and more traditional measures of organizational performance provides clearer results. The two empirical studies that study risk as a dependent variable find real options to have no effect (Miller & Reuer, 1998a, 1998b), and that real options actually increase risk (Reuer & Leiblein, 2000). This suggests that any organizational benefits of using real options are not felt in terms of reduced risk. Raynor (2000) found that real options in the form of hybrid diversification results in higher expected performance. In addition, McGrath and MacMillan (2000) found that experts using real options reasoning to value startups were able to predict future success. Together, these results point to a strong relationship between options use and organizational performance.

## 2.2 Real Options in International Business Literature

Previous real options studies in international business literature (Kogut, 1983; Kogut & Kulatilaka, 1994; Bowman & Hurry, 1993; Reuer & Leiblein, 2000; Folta et al., 2001) can be divided into three main categories: international investment as real options, effects of external factors on real options outcome, and market reactions.

### *2.2.1 International Investment as Real Options*

Several researchers have treated international investments as option-like, because such investments can provide preferential access to rent-generating future opportunities (Kogut & Kulatilaka, 1994; Mello, Parsons & Triantis, 1995; Lee & Makhija, 2003). These initial investments permit the firm to take advantage of better subsequent opportunities abroad without necessarily having an absolute obligation to commit to a particular course of action. Thus, this strategy allows them to improve strategic and operational flexibility during periods of extreme uncertainty (Miller & Reuer, 1998a, 1998b; Tang & Tikoo, 1999). Two major types of international involvement include exporting (Broll, 1999) and foreign direct investment (FDI) (Campa, 1994; Dunning, 1980). In the case of exporting, an established infrastructure, for example, allows firms to respond more rapidly to unanticipated changes in demand from both domestic and international markets (Lee & Makhija, 2003). Firms with production facilities located globally can benefit from their ability to change production locations in response to unexpected adverse conditions in any given country, such as increases in labor costs or exchange rate volatility (Reuer & Leiblein, 2000; Kogut &

Kulatilaka, 1994), as well as increased political risks (Makhija, 1993; Lee & Makhija, 2003).

Even though the attention given to international investments in the literature has been heightened, there is a lack of empirical evidence on the real options value of international investments. This lack of empirical studies may be attributed to the difficulties in assessing the real options value of international investments (Lee & Makhija, 2003). Such challenges include several requirements. Lee and Makhija (2003) point out the need for a sizeable sample of firms that differ in the types of investments they have made ex ante to a massive value-effecting increase in uncertainty, an identifiable moment when uncertainty shifts dramatically, and measurable ex post performance outcomes for the differing ex ante investment strategies. Such conditions enhance the real options values of firms. If international investments were perceived as having significant real options values, then it would support the idea that firms, which can exercise flexibility in uncertain conditions, outperform firms that commit themselves to an irreversible course of action.

International investments have been recognized as having the ability to provide real options by several studies, including Broll (1999), Kogut (1983, 1985), Kogut and Kulatilaka (1994), and Bowman and Hurry (1993), etc. For example, a firm that has made exporting investments is able to allocate sales of its domestic production among both domestic and foreign markets. In the case of extremely rapid change in exchange rates (Broll, 1999), or a rapid decline in domestic demand, the firm's option to export increases in value. Under such exchange rate volatility, the benefits of the export option

take the following form: When the domestic currency depreciates, exports can be increased in line with more advantageous realized prices. When the domestic currency appreciates, exports can be reduced, potentially to zero (Lee & Makhija, 2003). When the exchange rate once again permits profitable exports, the firm resumes exporting (Broll, 1999). A change in consumer demand, either domestic or abroad, can also increase the value of the exporting option, allowing the firm to increase or decrease its product offerings accordingly. When domestic demand decreases (increases), the firm can increase (decrease) exports (Lee & Makhija, 2003).

Foreign direct investment involves the establishment of subsidiaries or affiliates in foreign locations. This type of investment involves escalated operational commitment to foreign markets (Aulakh, Kotabe & Teegen, 2000). Markets that are difficult to penetrate via exports, due to transportation costs and/or trade barriers, are entered into via foreign direct investment. Because its operations are distributed across multiple geographic locations, an MNE can respond to country-specific environmental shocks and fluctuations, or unanticipated opportunities, by shifting factors of production across national borders (Kogut, 1983, 1985; Kogut & Kulatilaka, 1994). It is this ability that provides firms with an enhanced flexibility to avoid downside risk and exploit new profit opportunities (Tang & Tikoo, 1999; Lee & Makhija, 2003).

FDI has several characteristics that give rise to options not available with pure exporting investments. Managers can make production decisions that maximize profit by shifting production to locations with more beneficial cost structures (Tang & Tikoo, 1999). Thus, if an environmental change causes the labor costs in a given location to

increase, a firm with operational flexibility can shift labor-intensive operations to other lower-cost locations. The MNEs may be able to vary the locations in which to declare profits, depending on differential taxation and permissible transfer pricing policies in the countries in which they operate (Lee & Makhija, 2003). Moreover, they can modify the locations in which to concentrate market power, based on the analysis of competitive forces. Hamel and Prahalad's (1995) discussion of cross-subsidization can also be extended in this direction. Multinational firms have the ability to cross-subsidize their operations, flexibly allocating profits of some subsidiaries to support others experiencing unexpected environmental fluctuations (Lee & Makhija, 2003).

While operational flexibility is of potential value to the firm, there are tradeoffs for managing and maintaining a multinational network of subsidiaries in terms of high costs that can offset the real options benefits (Rangan, 1998). Hitt, Hoskisson and Kim (1997) point out the large transactions costs associated with the complexity of country-specific transactions in a given subsidiary, including those associated with the number of suppliers, customers, distributors and government agencies. In addition, the implementation of decisions to transfer production is not typically clear. Transportation costs, changes in export and import duties, and variations in the government interventions, for examples, may make it difficult to determine the true costs of switching production from one location to another. Finally, the ability to transfer production from one location to another depends on the nature of the operations in each country. Since the firm's factories in different countries are geared towards satisfying country-specific demand, the potential for transferring production from one country to

another is quite limited. Therefore, while the potential for operational flexibility is enhanced by multinational operations across multiple countries, the firm needs to configure its operations in a way that such benefits exceed the costs of managing the multinational network.

### *2.2.2 Effects of External Factors on Real Options Outcome*

The empirical evidence on international investments is both very limited and conflicting (Lee & Makhija, 2003). Both the Allen and Pantzalis (1996) and Tang and Tikoo (1999) studies find support for operational flexibility in their studies of breadth and depth of multinational networks. They indicate that firms with a broad distribution of subsidiaries across many national contexts are associated with higher market value than those characterized by a higher concentration of subsidiaries in a single country. Miller and Reuer (1998a, 1998b) show some evidence of real options benefits derived from exchange rate risk in the pricing strategies of a small percentage of U.S. manufacturing firms. In contrast, Reuer and Leiblein (2000) observe that greater multinationality does not help firms to reduce downside risk. Instead, they find that such investments result in higher bankruptcy and income stream risks. Rangan (1998) finds that firms attempt to manage flexibly, but the need for localization in their foreign direct investment has the effect of impeding intended flexibility. In addition, Campa's (1994) study of multinational investment under uncertainty provides support for the notion that such firms invest abroad for the purposes of risk diversification rather than operational flexibility.

These conflicting findings indicate the need for further investigation of the real options value of international investments (Lee & Makhija, 2003). Since real options have greater value under higher uncertainty, the external conditions under which international investments are examined is also extremely important. It is often assumed, for example, that exchange rate risks are the greatest source of uncertainty faced by multinational firms. However, it is not clear if exchange risk is always a source of uncertainty great enough to exceed the threshold for exercising the option, especially when firms are often able to hedge these risks. In contrast, extreme and unanticipated changes in industry context, political risks, and operational conditions may have larger implications for the firm (Kogut & Kulatilaka, 1994; Allen & Pantzalis, 1996; Tang & Tikoo, 1999).

*2.2.3 Market Reactions*

Lee and Makhija (2003) also note that, since virtually all of the prior studies have focused only on foreign direct investment, the literature currently offers little or no evidence on the real options value of exporting, or on the relative real options benefits of different types or combinations of international investments. The different types of international investments as important sources of real options for firms should also be examined (Broll, 1999). While exporting entails fewer costs and is the preferred mode of entry for firms without extensive international experience (Chang, 1995; Chang & Rosenzweig, 2001), foreign direct investment is associated with potentially higher costs and benefits (Aulakh et al., 2000). Therefore, it remains an empirical question as to which is a preferable source of real options for firms. In addition, since firms often use a

combination of the two, it would be interesting to examine the existence of possible synergistic benefits between them (McGrath & Nerkar, 2004; Lee & Makhija, 2003).

## 2.3 Influential Factors on Real Options Outcome

As previously mentioned, researchers in the real options area have pointed out the need to develop a more comprehensive real options model as an attempt to deal with unresolved issues such as conflicting results in the empirical findings. Many researchers have alluded to contextual factors such as firm and industry factors as having influence on the outcome of the real option process (e.g., Adner & Levinthal, 2004a, 2004b; McGrath, 1997, 1998). Influential factors on real options outcome for the MNEs can be divided into three main categories of country-specific factors, industry-specific factors, and firm-specific factors. Within each category are sub-factors that are of this study's interest. These sub-factors will be examined for their effects on the relationship between the real options creation and the different types of real options exercise (i.e., growth options, delay options, and exit options).

### *2.3.1 Country-specific Factors*

As commonly discussed in the international business literature, country-specific factors are the factors that multinational enterprises encounter in addition to the firm-level and industry-level factors similarly encountered by the domestic firms (Hill, 2003; Makino, Isobe, & Chan, 2004). These dynamic, macro-environmental factors can have significant effects on MNEs' strategies, including real options decisions. The country-specific factors that affect MNEs' international investment decisions can be divided into

three main areas: political issues, economic issues, and government intervention issues (Hill, 2003).

Political and economic stability, along with the degree of government interventions in international trade, are powerful determinants of MNEs' investment decisions on location (Feils & Sabac, 2000; Fatehi-Sedeh & Safizadeh, 1989; Bengoa & Sanchez-Robles, 2003; Lin, Szenberg, & Webster, 2001; Benito, 1997). Thus, examining the role of these factors in MNEs' real options process may lead to a better understanding of the option choices and the market reactions to these choices based on the situation. Political issues mainly are concerned with the level of risk in the host country (Jones, 1984; Agmon & Findlay, 1982; Henisz & Delios, 2004). The higher the political risk level, the less desirable is the country as an investment destination. The economic issues focus on the stability of the host country's economic systems and whether there is room for growth. High economic potential increases the desirability of a host country (Benito, 1997; Lin, Szenberg, & Webster, 2001).

International business scholars (e.g., Hill 2003) argue that free trade and less government intervention in the international trade arena are desirable traits for a host country to attract foreign-direct investment (FDI). Host government can intervene in international trade in various forms such as trade barriers, trade and FDI restrictions, and differential tax treatment. Empirical studies found that qualitative factors such as the level of economic freedom and the level of international regulations of a host country significantly affected the foreign direct investment decision (e.g., El Kahal, 2001; Bengoa & Sanchez-Robles, 2003). The less involvement of the host country

government in these issues, the more open is its economy, and in turn, the more desirable the country (Doz, Bartlett, & Prahalad, 1981; Doucouliagos, 2005; Goel & Nelson, 2005; Paldam, 2002).

*2.3.2 Industry -specific Factors*

In addition to the firm-specific factors, researchers are also aware of the possibility that industry effects can influence the real option decisions (e.g., Adner & Levinthal, 2004a, 2004b). Industrial organization literature has emphasized the importance of industry effects on firm's strategies and performance (e.g., Schmalensee, 1985; Rumelt, 1991; McGahan & Porter, 1997, 2002). One of the most important industry-specific factors that can likely impact MNE strategies is the competition level within the industry (Porter & Millar, 1985). This study will investigate industry effects primarily as competition level. The changes in the competition level can significantly affect how a firm changes its real option choices from the growth options to the options to delay or exit when the competition level increases (Adner & Levinthal, 2004a).

Several past studies point out the arguments for and against expediting an exercise of the growth option. First mover advantage argument proposed that hyper-competitive industry with several competitors exercise the growth option as fast as possible because it will help firms capture the first-mover advantage such as brand recognition by the consumer. Looking at the growth options exercise through the transaction cost lens (Williamson, 1975), it is better to exercise the growth options as fast as possible following the option creation in order to reduce opportunity costs of asset specificity. Game theory, on the other hand, justifies growth options exercise by

proposing that firms should follow their competitors' moves. The argument against rapid growth option is the second mover and follower advantage argument that the more competitors, the less likely MNEs will plan for growth strategies. Along this line of argument, holding options can be seen as favorable because of high uncertainty level.

*2.3.3 Firm specific Factors*

From previous research, firm-specific factors can be grouped into three areas: financial issues, managerial issues, and other issues that specifically affect the particular firm (Adner & Levinthal, 2004a; Reuer & Leiblein, 2000; McGrath, 1998). In terms of firm's financial issues regarding financial capabilities, Jensen and Meckling (1976) and Jensen (1986) argued that free cash flow can lead to over diversification by managers. However, the focus of this study is not diversification, but rather cases in which MNEs simply expand to new foreign market in their core business. Therefore, greater financial capability should lead to a more favorable condition for MNEs to plan for international growth (Trevino & Grosse, 2002).

In terms of managerial issues, executive changes can have a direct effect on MNE strategies, including the investment plans (e.g., Wiersema, 1992, 1995). Past studies in executive succession suggested that changes in the key position will often lead to a delay and/or exit from current strategies and plans. The underpinning reason may be that the strategic changes tend to be more pronounced in the succession process – mechanism for realignment with the organizational or environmental context – to overcome organizational inertia and resistance (Ocasio, 1994; Tushman & Romanelli, 1985). Another possible reason is that the new executive needs time to reevaluate and

learn the strategy, organization, and its environment during the early stages. Therefore, delaying and/or exiting from the real options can be viewed as positive after this significant change.

In terms of other firm-specific issues, resource-based view (RBV) logic helps explain why a plan to grow may not be considered as favorable for all firms. Because each firm's resource bundle is unique, it follows that so is each firm's opportunity set (resource heterogeneity concept). The firm's resource bundle is the source of its competitive advantage that is unique and hard to imitate (Barney, 2002). Therefore, if there is a change that impacts the firm's unique resource, it will affect firm's opportunity and its strategic direction (Kraatz & Zajac, 2001). For MNEs, one of the most important capabilities to possess is firm's international experience (Chien, 2005). Trevino & Grosse (2002) found that firms are more likely to grow internationally when they have favorable resources for international business operations, including more international experience. Financial markets often give MNEs that have a lot of success and experience in international business the benefit of doubt.

Ownership structure and its effects on firm's strategies have also been widely studied (e.g., Bethel & Liebeskind, 1993; Denis, 1992; Lee & O'Neill, 2003; Thomsen & Pedersen, 2000). Bethel & Liebeskind (1993) confirmed previous findings that ownership concentration increases strategic efficiency and firm performance. It highlights the importance of major shareholders as having a significant effect on the ability to decide and control firm's investment decisions. The issue of managerial control as described by Agency Theory (Jensen & Meckling, 1976) seems to be less of

an issue when the ownership concentration increases (Thomsen & Pedersen, 2000). As previously mentioned, the ultimate goal of real options creation through an initial investment is to expand in the future once the external and internal conditions become favorable. Concentrated ownership, therefore, provides the structural stability and control that firms may need to proceed with the investment plan.

In this study, some of the issues as mentioned in the previous literature review, namely the effects of country, industry, and firm specific factors on the real options process, will be addressed. The next section develops sets of hypotheses assessing the real options value of the international investments of multinational enterprises, based upon the types of options exercise and contextual factors both within and outside of the MNEs.

# CHAPTER III

# HYPOTHESES DEVELOPMENT AND MODEL

The previous chapter presented past research on real options in management and international business fields, the factors that may contribute to the conflicting findings, the role of options exercise types, as well as the real options impact on market reactions. In this chapter, a closer look at real options process and the effects that contextual factors may have on the options exercise will be examined. Based on an extensive review of past literature, thirteen sets of hypotheses were derived as follows.

## 3.1 Type of Options Exercise Antecedents

The purpose of a real option creation regarding the international investment is to maintain an international strategic flexibility in the market abroad. The real focus, then, is to see whether firm would proceed with the expansion, or pull out of the initially invested foreign market. Since resources of a firm are often limited, effective asset redirection from an unprofitable project to one with more potential can tremendously reduce the opportunity cost. Thus, the ability to forecast the likelihood of the type of options to be exercised by firms in the future is crucial. Several indicators of the type of option exercise can be summed up into four major antecedents: the nature of the initial investment (options creation); host country conditions; industry condition; and firm-specific conditions. The predictor model is presented in Figure 1 on page 38.

Firm's level of financial involvement in the initial international investment can affect the subsequent option strategies. To clearly distinguish the different levels of firm's financial involvement, the nature of option creation can be categorized into a joint venture (initial investment with at least one partner) and a wholly-owned investment (100% owned by firm). Joint-venture literature, specifically, the international joint venture literature, has acknowledged the difficulties of managing a successful partnership (e.g., Kogut, 1991; Chi, 2000; Chi & McGuire, 1996). Evidence of low survival rate of a joint venture partnership clearly increase the likelihood of delay and/or exit options from the initial investment abroad as the next step. In contrast, the wholly-owned investment means that MNE will have a tighter control on the investment and can be more focused on the plan to proceed with the future growth plan.

*Hypothesis 1a: Joint venture will have a negative impact on the decision to expand the initial investment (i.e., delay or exit options).*

*Hypothesis 1b: Wholly-owned initial investment will have a positive impact on the decision to expand the initial investment (i.e., growth options).*

Host country environment can also influence the execution of firm's strategy regarding the initial investment (Hill, 2003). A favorable condition in a host country would increase the likelihood of firm to expand within that market. Economic condition, political condition, and the role of government intervention in terms of law and regulations can tremendously affect the way a firm proceeds with the initial investment. More specifically, a host country with a low level of political risk, an

increase in economic growth rate, and less government intervention should provide a favorable condition for an MNE to exercise the growth option.

*Hypothesis 2a: Political risk level in the host country will have a negative influence on the decision to expand the initial investment (i.e., delay or exit options).*

*Hypothesis 2b: An increase in economic growth rate will have a positive influence on the decision to expand the initial investment (i.e., growth options).*

*Hypothesis 2c: The economic freedom in the host country will have a positive influence on the decision to expand the initial investment (i.e., growth options).*

Industry conditions also can influence firm strategies. Competition level within the industry is one of the most important influences on firms, especially MNEs. Competitive pressure from the rival firms within the home-country industry setting can lead the MNEs to seek market share in a new foreign market (Hill, 2003). Therefore, the MNEs in a highly competitive industry are more likely to aggressively expand abroad. In contrast, a monopolistic and/or oligopolistic industry (i.e., concentrated industry) faces less pressure to aggressively exercise growth options.

*Hypothesis 3a: Low industry concentration (highly competitive industries) will have a positive influence on the decision to expand the initial investment (i.e., growth options).*

*Hypothesis 3b: High industry concentration will have a negative influence on the decision to expand the initial investment (i.e., delay or exit options).*

Firm's own condition can also affect the way its strategies evolves and/or changes overtime. Financial, managerial, resource and capabilities, and governance are all influential factors affecting the decision to expand. Since this study is only focusing on firm's core business expansion, and not a diversification, a counter-argument of the agency cost of free cash flow perspective (Jensen, 1986) can be made regarding firm's financial condition. More cash flow availability should enable the MNEs to pursue growth strategy abroad. Because of the organizational inertia and the need for new executives to learn about their new environment (Ocasio, 1994), changes in executive positions may lead to postponement of the plan to grow abroad. As mentioned earlier, international experience is one of the most important assets of an MNE (Trevino & Grosse, 2002). Thus, more international experience should enable the MNE to manage and effectively pursue growth in a timely manner. Based on previous studies (Bethel & Liebeskind, 1993; Thomsen & Pedersen, 2000), more concentrated governance by a group of major shareholders should lead to a tighter and more effective control, which, in turn, should also expedite the MNE's plan to grow.

*Hypothesis 4a: Level of cash flow of the MNE will have a positive influence on the decision to expand the initial investment (i.e., growth options).*

*Hypothesis 4b: Changes in executive positions will have a negative impact on the decision to expand the initial investment (i.e., delay and exit options).*

*Hypothesis 4c: Firm's level of international experience will have a positive influence on the decision to expand the initial investment (i.e., growth options).*

*Hypothesis 4d: Ownership concentration will have a positive impact on the decision to expand the initial investment (i.e., growth options).*

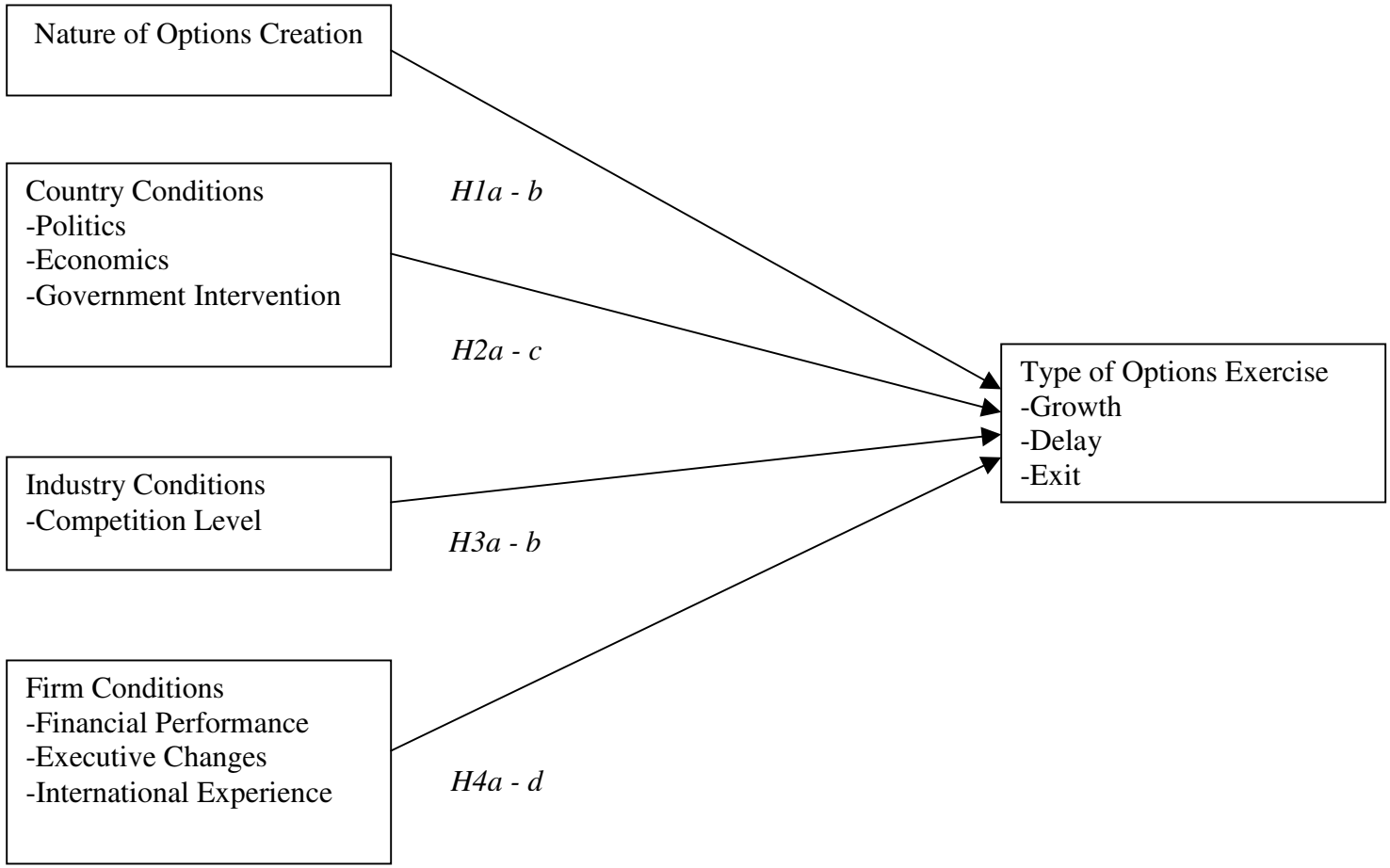


**Figure 1 – Type of Options Exercise Antecedents**

## 3.2 Market Reactions on Options Creation

Other things being equal, an announcement of a new investment in itself is considered as good news. Firms usually plan an expansion when they are doing well in their existing business. An announcement of a new investment usually indicates that the firms are ready to undertake a new investment to further their business goals. This is especially true for international and multinational firms. In this information age, one can usually assume that a public announcement of new investment is a result of a thorough market research to identify the possibilities and potential success. In the case of real options creation, the firms' announcement of the initial investment can be viewed as creating flexibility and adding value to the firm. Thus, these types of announcement should lead to a positive market response. Following the real options logic, creating options (i.e., not investing in one large investment all at once) will result in positive market reaction for the MNEs. A plausible explanation is that investors realize that the current global market has high level of uncertainty. Therefore, committing a large amount of an MNE's resources into a single or a few projects can reduce its flexibility and increase risks. Moreover, the second-mover advantage (e.g., Cottrell & Sick, 2002) argument also supports the real options creation and the concept of holding on to the options.

*Hypothesis 5: Other things being equal, options creation will result in a positive market reaction.*

## 3.3 The Relationship between Options Creation and Options Exercise

In order for a new investment announcement to qualify as a real options creation in this study, the announcement must specify the possibility of subsequent, larger investment for future growth. In addition, the firms must have flexibility in terms of choices and options to divert or exit out of the investment project if and when the contextual factors become unfavorable. In this study, the focus is on options creation that will either lead to the subsequent exercise of growth options, delay options, or exit options.

## 3.4 Market Reactions on Options Exercise

According to the previous literature review, especially based on Adner & Levinthal (2004a), certain types of options seem to have a positive connotation, while others are viewed as a sign of failure. More specifically, an option to grow signals that a firm is taking advantage of real option decisions to successfully invest in the international market. In contrast, an announcement of the exercise option to delay or exit is often viewed as a result of an unsuccessful initial investment. Transaction Cost Economics (Williamson, 1975) argument of opportunity cost, or convenience value, points out that once the investment plan has been created, there is an opportunity cost of waiting to commit the resource into the project. Therefore, the higher the convenience value, the faster the growth options exercise should be accelerated. The following set of hypotheses is based on these perspectives.

*Hypothesis 6a: Other things being equal, the exercise of growth options will result in a positive market reaction.*

*Hypothesis 6b: Other things being equal, the exercise of delay options will result in a negative market reaction.*

*Hypothesis 6c: Other things being equal, the exercise of exit options will result in a negative market reaction.*

## 3.5 Moderating Effects of Country-specific Factors

### *3.5.1 Political Risk*

Political risks can influence MNEs' choices of options to exercise. If an unfavorable change in the host country's political systems occur between the options creation and exercise stages, a dramatic shift in the real option plan from growth to delay or exit options may be inevitable. However, if the change is in the favorable direction, an increased level of growth options commitment is also possible. In this case, the delay and exit options may be less attractive than the growth options and vice versa. Base on the international business literature, the higher the political instability, the less desirable the destination. Therefore, high political risk level reduces the desirability of the growth option. The opposite is true for delay and exit options.

*Hypothesis 7a: Political risk level in the host country has a negative moderating effect on the relationship between the exercised growth options and the market valuation.*

*Hypothesis 7b: Political risk level in the host country has a positive moderating effect on the relationship between the exercised delay options and the market valuation.*

*Hypothesis 7c: Political risk level in the host country has a positive moderating effect on the relationship between the exercised exit options and the market valuation.*

*3.5.2 Economic Growth Rate*

Economic growth rate is an important indicator of the host and home countries' stability in economic systems. An increased economic growth rate may indicate larger emerging markets, higher potential for profits and more possibilities for the MNEs to invest in that location. The growth options may become more attractive, especially when the growth rate trend shows long-term potential. Delaying or exiting from the investment options when the economic growth rate is on the rise may yield unfavorable market reactions and vice versa.

*Hypothesis 8a: Positive economic growth rate has a positive moderating effect on the relationship between the exercised growth options and the market valuation.*

*Hypothesis 8b: Positive economic growth rate has a negative moderating effect on the relationship between the exercised delay options and the market valuation.*

*Hypothesis 8c: Positive economic growth rate has a negative moderating effect on the relationship between the exercised exit options and the market valuation.*

### *3.5.3 Economic Freedom*

Economic freedom is another economic indicator that measures how open the host country is to international trade. Several political, economic and legal aspects of a host country, such as trade policy, fiscal burden of government, and government intervention in the economy, are analyzed in order to interpret the degree of economic freedom. Although there may be a correlation between the economic freedom index and the economic growth rate, these two factors remain separate constructs because the former focuses more on the government activities than the latter indicator. Using both indicators can better capture the country-specific conditions. If an MNE operates in an economically free location, there are more opportunities for growth. When the level of economic freedom decreases, the delay and exit options become more attractive. Following the common argument in international business (e.g., Hill, 2003), the less the involvement of the government, the more desirable the destination and growth options.

*Hypothesis 9a: The economic freedom in the host country has a positive moderating effect on the relationship between the exercised growth options and the market valuation.*

*Hypothesis 9b: The economic freedom in the host country has a negative moderating effect on the relationship between the exercised delay options and the market valuation.*

*Hypothesis 9c: The economic freedom in the host country has a negative moderating effect on the relationship between the exercised exit options and the market valuation.*

### 3.6 Moderating Effects of Industry-specific Factors

Level of competition in the host-country industry can have a significant impact on the decision of real options exercise types. If a firm faces a rapid increase of competition, within the host country, between the times of options creation and options exercise, changes in its real options plan from growth options to delay or exit options may make sense and/or become a necessity. Options that the firm holds may become less attractive to exercise when these changes occur, especially when the competitors hold the same or similar options. In contrast, if the firm's competition level within the host country decreases during this time, it may mean that the growth options are more favorable than the delay options and the exit options. In this situation, if the firm chooses options other than growth, the market reactions that follow may be negative ones.

From a home-country environment perspective, MNEs in highly competitive (less concentrated) industries may be pressured to aggressively pursue growth strategy abroad to gain more market share. In contrast, if an MNE's home-country industry is

more concentrated (i.e., less competition), the MNE is not forced to exercise a growth option in a foreign market. In this case, holding on to options (i.e., delay) may make more sense than rushing into growth options. In addition, MNEs in a highly concentrated home-country industry can choose to further delay or exit more easily than MNEs facing fierce competition in the home-country environment. The hypotheses on moderating effects of competition are derived from the above discussion.

*Hypothesis 10a: Competition will have a positive moderating effect on the relationship between the exercised growth options and the market valuation.*

*Hypothesis 10b: Competition will have a negative moderating effect on the relationship between the exercised delay options and the market valuation.*

*Hypothesis 10c: Competition will have a negative moderating effect on the relationship between the exercised exit options and the market valuation.*

## 3.7 Moderating Effects of Firm-specific Factors

### *3.7.1 Firm's Financial Performance*

Financial performance is an important factor in any investment decision. Other things being equal, if a firm is performing well financially, investment tends to follow through as planned. In contrast, if the firm's financial performance is substandard, investment plans tend to be delayed and/or even cancelled. Thus, a change in firm's financial performance is particularly important in the real options decision. There are several ways to capture the financial performance. The frequently used measures

include returns on investment (ROI), return on asset (ROA), return on equity (ROE), and cash flow as indicators of a firm's financial capability. This set of hypotheses is also based on the counter argument of Jensen's (1986) free cash flow argument. As stated previously, this study focuses on international expansion in the core business of the MNEs. Thus, this type of growth expansion should gain positive response from the market regarding the MNE's value, and vice versa for the non-growth strategies of delay and exit options.

*Hypothesis 11a: High level of cash flow of the MNE has a positive moderating effect on the relationship between the exercised growth options and the market valuation.*

*Hypothesis 11b: Low level of cash flow of the MNE has a positive moderating effect on the relationship between the exercised delay options and the market valuation.*

*Hypothesis 11c: Low level of cash flow of the MNE has a positive moderating effect on the relationship between the exercised exit options and the market valuation.*

*3.7.2 Executive Changes*

Executive changes can also affect firm's strategies (Wiersema, 1992, 1995), including the initial real options strategy, prior to the changes. New executives may disagree with the former executives, and thus, may postpone or cancel strategic plans

made by their predecessors when the changes occur. With a few exceptions, the executive changes often come about when firms are performing poorly and are in need of dramatic changes, which include strategic changes in investment plans. In this case, growth options would mostly be perceived as unwise. Delay options and growth options tend to be the more logical choice in this situation. Thus, the effect of executive changes during the real options process has a clear impact on the types of options exercise. Based upon the executive succession literature (e.g., Wiersema, 1992, 1995; Occasio, 1994), such significant changes within the firm may lead to the need to defer or exit from previous strategy to grow.

*Hypothesis 12a: Changes in executive positions have a negative moderating effect on the relationship between the exercised growth options and the market valuation.*

*Hypothesis 12b: Changes in executive positions have a positive moderating effect on the relationship between the exercised delay options and the market valuation.*

*Hypothesis 12c: Changes in executive positions have a positive moderating effect on the relationship between the exercised exit options and the market valuation.*

*3.7.3 Firm's International Experience*

Based on RBV logic, firm's unique experience is also an important factor in determining the types of options exercise. The unique experience in this case is the MNEs' international experience that the individual firms encounter that no other firms experience in the exact same way (Trevino & Grosse, 2002). The more experience an MNE has internationally, the more favorable for firm to expand effectively, and thus, yield positive market valuation. Inexperienced firms, on the other hand, may encounter problems due to their lack of expertise in foreign market entry, and thus, may have to resort to delay and/or exit options. In such case, the inexperience should intensify the negative relationship between the non-growth options and the market valuation.

*Hypothesis 13a: Low level of firm's international experience (i.e., unfavorable unique experience) has a negative moderating effect on the relationship between the exercised growth options and the market valuation.*

*Hypothesis 13b: Low level of firm's international experience has a positive moderating effect on the relationship between the exercised delay options and the market valuation.*

*Hypothesis 13c Low level of firm's international experience has a positive moderating effect on the relationship between the exercised exit options and the market valuation.*

Figure 2 below summarizes Hypotheses 4-12.

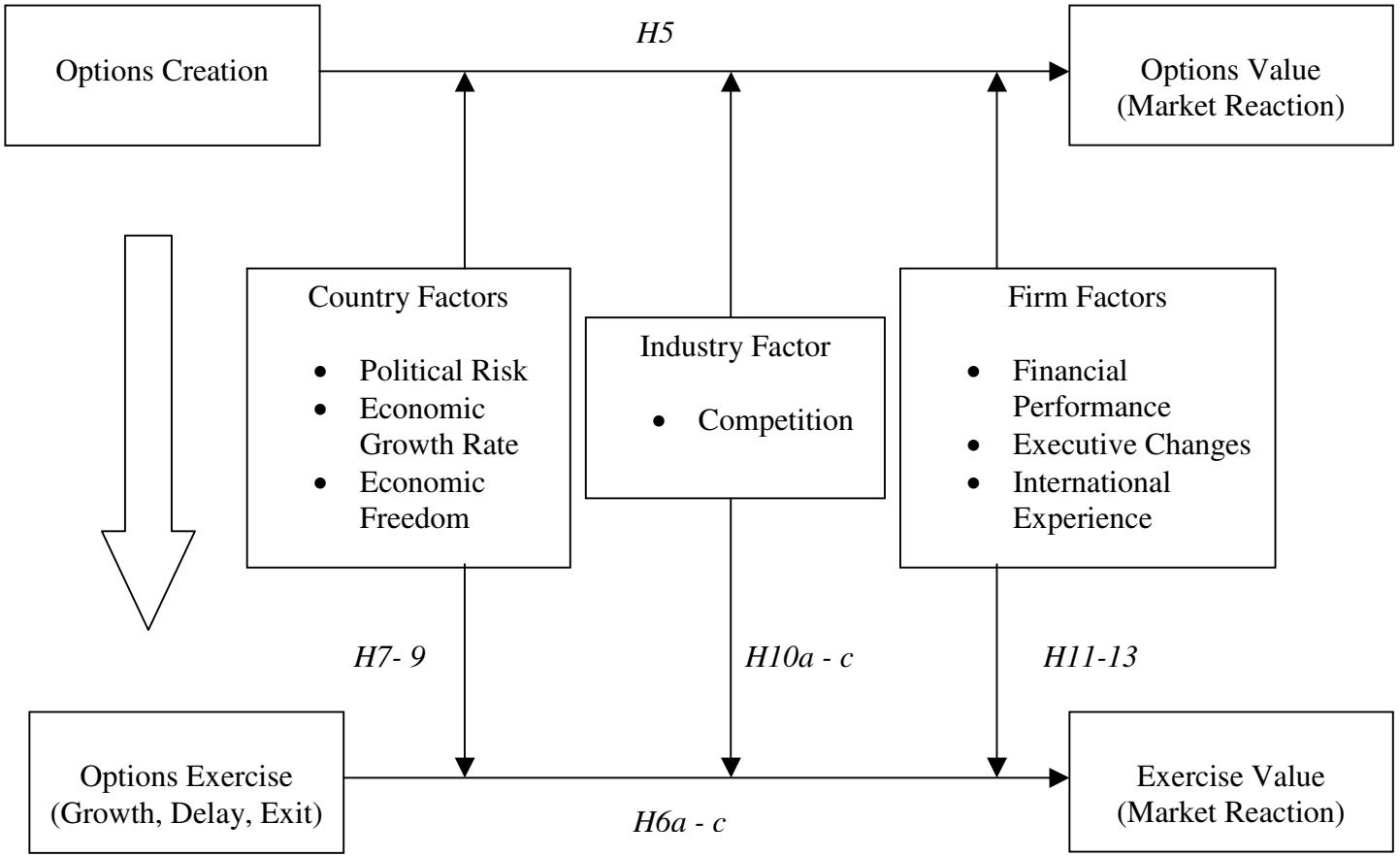


**Figure 2 – Overall Real Options Model**

# CHAPTER IV

# METHODS

This chapter will discuss the specific methodology used in this study. The chapter is divided into three sections. The first section will discuss the study design and sample, the second section will give a description of the measures, and the third section will discuss the statistical techniques for the data analysis.

## 4.1 Study Design and Sample

The data for this study were obtained through several archival sources. Country-specific data were compiled through the *Euro Money* magazine, the Heritage Foundation/Wall Street Journal, and the CIA World Fact Book. The industry-specific data were gathered through SetSmart, the Stock Exchange of Thailand (SET) database. The SET database was also utilized for firm-specific data and the securities and market information. LexisNexis Academic database was used as a supplementary source for company announcements.

This study focuses on companies in the Thai stock market because of its relatively higher uncertainty level, as compared to a more developed market. International investments, therefore, are more likely to be perceived as having high option values and would yield significant market reactions. However, the sample size from the Thai stock market is clearly smaller, and the scope of investment focuses more

heavily on investment in the Asian region. Although a sample from the developed market such as the New York Stock Exchange (NYSE) will provide a larger sample size and has a wider range of countries in several regions, it is considered less suitable for this study. The NYSE environment has relatively less uncertainty, which is one of the conditions necessary to justify real options approach to investment. Thus, the NYSE market reactions to options creation and options exercise may not be as significant as the SET market reactions to similar events. Moreover, the accessibility of data was also taken into consideration when choosing among the emerging markets.

Based upon a power analysis for testing via multiple regressions, a necessary sample size of 213 was determined to be adequate. This calculated sample size is based upon the following determinants: nine independent variables; significance level of 0.05; an *a priori* desired power of 0.95; and small estimated effect size of 0.10.

The sample size was arrived at using the formula:

$$n = \lambda / f^2,$$

where $n$ represents the sample size needed to achieve the desired level of power. Lambda is a function of the desired significance level and power combined with the numerator and denominator degrees of freedom (obtained based upon the number of independent variables). The value of $\lambda$ for the proposed study is 23.59 (Cohen & Cohen, 1983). The effect size index, as represented by $f^2$ in the equation above, is calculated using the following equation suggested by Cohen (1988):

$$f^2 = ES / (1 - ES).$$

Based upon the estimated effect size of .10, $f^2 = .1111$, thereby producing an $n$ of 213 when calculated according to the formula above.

The final sample consisted of 281 initial-international-investment announcements of 46 Thai MNEs listed in the Securities Exchange of Thailand for the period of 1995-2005. These announcements were matched with 281 subsequent announcements regarding further actions of these initial investments. The main source of the announcements was the SET database, with LexisNexis Academic as a supplementary source of the international investment announcements.

## 4.2 Measures

### *4.2.1 Independent Variables*

The nature of the initial international investment was used as a proxy for options creation in the supplemental analysis model. This dichotomous variable was categorized as either a joint venture or a wholly-owned subsidiary. The theoretical basis for this proxy is from the recent debate in the 2004 issue of *Academy of Management Review* on a definition of real option. Adner and Levinthal (2004a) pointed out that real options have been defined too vaguely by some scholars and proposed that the classification of an investment as a real option needs to be more stringent and clearly defined. McGrath et al. (2004) argued that real options in management literature should be more broadly defined in order for the field to develop. A more recent real option manuscript in the management field by Lee and Makhija (2003) also vigorously argued that several types of international investments qualified as real options. More specifically, they argued that export and wholly-owned subsidiary decisions can also be considered real options

because they help the company gain a foothold into the new market, and thus, kept the firm's option regarding that new market open. Content analysis of the MNE announcement was performed to search through companies' initial international investment plans. The announcements by the MNEs regarding any new international investment, for examples, in a new country, in a new international market, and/or with an international joint venture partner, were dummy-coded as 1 if the investment was a joint venture and as 0 if it was a wholly-owned subsidiary.

The predictor model independent variables are the nature of options creation (joint venture= 1, wholly-owned initial investment = 0), host country factors (political risk, economic growth rate, and economic freedom), industry factor (competition level in form of industry 4-firm concentration ratio), and firm-specific factors (firm's cash flow, executive changes, international experience, and ownership concentration). The percentage of ownership of the largest shareholder a year prior to the options exercise was used as a proxy for the ownership concentration.

*4.2.2 Dependent Variables*

The three dependent variables in this study are options value, exercise value, and the type of options exercise. The market reaction (i.e., return on stock) immediately after the options creation announcement was used as a proxy for options value (Hypotheses 5-6). A proxy for the exercise value is the market reaction after the options exercise announcement.

The second measure of option value used in this study is Tobin's Q as suggested by Lee and Makhija (2003). The Tobin's Q is a standardized measure of the value

placed on a firm by investors. In the Tobin's Q calculation (Chung & Pruitt, 1994), the denominator represents the investment input in the firm, and the numerator captures the value created by the firm with these inputs. Lee and Makhija (2003) proposed that Tobin's Q is an appropriate measure for assessing real options value because it is a forward-oriented measure that adjusts for risk. Tobin's Q captures the value created from real options, after controlling for other traditionally recognized sources of value. The calculation is as follows:

$$\frac{\text{(Market value of common stock+ book value of preferred stock + book value of debt)}}{\text{Book value of total assets}}$$

Market value of common stock is calculated as the year-end share price multiplied by the number of shares outstanding (Hypotheses 7-13).

The dependent variable for the predictor model (Hypotheses 1-4) is the type of options exercise, which was measured as options to grow (0,0), options to delay (1,0), and exit options (0,1). The content analysis of the subsequent international investment announcements was performed to classify the action as growth, delay, or exit.

*4.2.3 Moderators*

Country-specific factors, industry-specific factors, and firm-specific factors are the three moderators of this study. These three moderators are further broken down into subcategories. Political risk, economic growth rate, and economic freedom measures were used to capture changes in the host-country condition (political issues, economic issues, and the role of government interventions in international trade) between the time

of options creation and options exercise. The level of competition was used as a proxy for changes in the industry condition for the same period. Firm's financial performance, executive changes, and unique experience will be used to capture changes in the firm's internal condition.

Political risk was measured by the host-country risk index, published each year by the *Euro Money* magazine. The change in political risk level is equal to the host-country risk index at the time of options exercise announcement subtracted by the host-country risk index at the time of options creation announcement. A positive value indicates an increased political risk in the host country. In contrast, a negative value indicates a decreased level of political risk. A zero value indicates no change in the political risk level of the host country.

The economic growth rates of the host countries were obtained from the CIA World Factbook database. Similar to the political risk calculation, the change in economic growth rate is equal to the host-country growth index at the time of options exercise announcement subtracted by the host country growth index at the time of options creation announcement. A positive value indicates an increased economic growth in the host country. A negative value indicates a decline in economic growth rate, and a zero value indicates no change in the host country's economic growth level.

Economic freedom and its implications have been widely studied in the political science field (e.g., Paldam, 2002, 2003; Karabegovic, Samida, Schlegel, & McMahon, 2003; Goel & Nelson, 2005; Doucouliagos, 2005). An appropriate proxy for the economic freedom, however, is still being investigated by researchers in this area

(Karabegovic et al., 2003; Goel & Nelson, 2005; Doucouliagos, 2005). In this study, the economic freedom is measured by using the host country index of economic freedom as published annually by the Heritage Foundation and *Wall Street Journal*. This index indicates the degree to which government intervenes in the international trade. The index measures how well countries score on a list of 50 independent variables in 10 broad factors of economic freedom. The scores range from one to five. The higher the score on a factor, the greater the level of government interference in the economy and the less economic freedom a country enjoys. More specifically, the scores between 1 and 1.99 indicate "free," the scores between 2 and 2.99 indicate "mostly free," the scores between 3 and 3.99 indicate "mostly unfree," and the scores between 4 and 5 indicate "repressed." The 50 variables are grouped into the following categories:

- Trade policy
- Fiscal burden of government
- Government intervention in the economy
- Monetary policy
- Capital flows and foreign investment
- Banking and finance
- Wages and prices
- Property rights
- Regulation
- Black market

The level of competition in the industry will be utilized as a proxy for the industry factor. This data was obtained from the SetSmart database. An increase in the level of competition between the initial FDI investment and the announcement of the options exercise will indicate less favorable change in the industry condition in the host countries, while decreased competition will indicate more favorable change. Four-firm industry concentration ratio is used to measure industry fragmentation. Low industry concentration indicates the absence of monopoly or oligopoly. This type of industry is considered to be competitive. Therefore, the higher the industry concentration, the more competition firms within the industry will have.

In this study, the proposed proxies used to capture the three areas of firm-specific factors are the changes in the firm's: financial performance; executive positions; and unique experience, between the times of an option creation announcement and an announcement of the chosen option to exercise. The logic for examining the changes in these proxies is to see whether the firm-specific factors will affect the type of options to exercise and/or their outcomes in terms of the market reactions as generally mentioned in the past research.

Firm's financial performance was measured using the firm's free cash flow level. This information was obtained from the SetSmart database. A simple calculation of subtracting the amount of cash flow at the beginning time period, i.e., the options creation announcement, from the amount of cash flow at the end of time period, i.e., the options exercise announcement, provides the level of change in the firm's financial

condition. A positive value indicates an increase in the firm's cash flow, while a negative value indicates a decrease in the firm's cash flow.

Executive changes data were obtained through content analysis of companies' announcements from the SET database. The effect of having changes in the firm's executive level (1) will be compared with the effect of having no change in the firm's executive positions (0) between the time of options creation and options exercise. A significant difference between the two conditions indicates support for the hypotheses on the moderating effect of executive changes factor.

Unique experience data were also obtained from SetSmart database, firms' announcements, websites, and their investor relations department. Content analysis was utilized to determine the number of years in international experience (first FDI investment). This experience can affect the firms' strategic decision regarding their options.

*4.2.4 Control Variables*

To isolate the effect of real options value of international investments, several control variables, which have the potential to influence the value of the firm, were included in the analysis. Following the method of Lee and Makhija (2003), the firm's past performance was controlled by including prior year's ROA in the equation. The log of total assets was used as a proxy for the firm size. The age of the firm was also controlled. This is done in order to separate the effect of the chosen option to exercise from the effects of past performance, firm's size and age.

## 4.3 Data Analysis

Data were analyzed with the use of logistic regressions, event studies and hierarchical regressions. Since the dependent variable in the type of options exercise antecedents model is a categorical variable, logistic regressions were used to test these predictors. Binary logistic regression was used to compare the growth options against the non-growth strategies (delay and exit options). Multinomial logistic regression was used to compare the exit options and delay options against the base category of growth options. Two models were estimated. The first model included only the control variables, while the second model also included the country, industry, and firm antecedents. Simultaneous assessment of the effects of country, industry, and firm specific antecedents on the type of options exercise was achieved in the second model.

The event study method has been used extensively in finance. In management research, this method has been used to study the effects of endogenous corporate events such as divestiture, corporate control changes, CEO turnover, strategic investment decision, and the formation of joint ventures (McWilliams & Siegel, 1997). The event studies method measures stock price changes in response to events. A single event study typically analyzes the average stock price reaction to instances of the same type of event experienced by many firms. The event date can vary from one stock to another in the same study, with dates measured in "event time".

In this study, the traditional event studies methodology as described by Boehmer, Broussard, and Kallunki (2002), was used. Sub-sample of 141 announcements was used in the event studies. The utilization of a sub-sample was

necessary in order to get accurate results. Announcements with multiple investment and announcements that are too close to other announcements by the same MNEs in the event window periods were excluded to guard against the confounding effects. Furthermore, announcements with missing market and/or stock returns data were excluded from the sample. As a result, several sets of sub-sample sizes were analyzed (e.g., 39, 52, and 72 options creation announcements for eleven-day, five-day, and three-day event windows, respectively). The purpose is to explore whether the market reactions of the options creation and the options exercise are at the significant level, and thus, infer the significance of the events. The abnormal return of the stock (AR) is obtained by subtracting the normal expected return in the absence of the event, E(R), from the actual return in the event period, R:

$$AR_{it} = R_{it} - E(R_{it})$$

Benchmark for the expected returns was derived from the market model, based on the average market returns and the firm-specific average returns from the past period. The traditional -250 to -50 day estimation period (250 days to 50 days before the event) was used in the market model of this study:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}, \text{ where } t = -250, \ldots, -50$$

where $\alpha_i$ is a constant for the *i*th stock, $\beta_i$ is the market beta of the *i*th stock, $R_{mt}$ is the market return, and the $\varepsilon_{it}$ is an error term (Boehmer et al., 2002). SAS program was used to run the event studies to test Hypotheses 5, 6a, 6b, and 6c.

Hierarchical regressions were also performed to study the moderation effects in the study (Baron & Kenny, 1986). Hypothesis testing was conducted through a series of

hierarchical regressions. Hierarchical regression was used to test the moderating effects of country-specific factors, industry-specific factors, and firm-specific factors on the relationship between the options (creation/exercise) and the market reactions. All moderating hypotheses were tested through the creation of interaction terms. The significance of the $R^2$ change and the beta weights of the interaction terms were examined.

Overall model significance, amount of variance explained, and significance of individual beta weights were examined to test the proposed relationships. Correlations between all variables and descriptive statistics are also provided in the next chapter.

# CHAPTER V

# RESULTS

Table 1 on page 69-70 presents descriptive statistics of means, standard deviations and correlations among the variables. The significance of the high correlation between the political risk and economic freedom was as expected because the economic freedom index is a highly aggregated measure integrating 50 factors into 10 major categories of country factors. Hence, some degrees of correlation between the index and other measures of the country factors were anticipated. However, the use of this index is justified by the fact that it comprehensively indicates the level of openness to international trade and investment by the host country government. Reduced models excluding the highly correlated measures are also discussed later in theanalysis.

## 5.1 Type of Options Exercise Antecedents

High correlation between the political risk index and the economic freedom index is expected due to the fact that the economic freedom index is an aggregated measure, encompassing 50 country-related factors. The results of reduced models excluding some country and firm measures will be discussed in detail in the Hypotheses Testing section. Table 2 (page 74) presents the binary logistic regression results for models 1 (controls only) and 2 (controls and predictors). Table 2 indicates that the model including hypothesized country, industry, and firm specific antecedents

significantly added to the explained variance in the type of option when it is compared to the controls-only model. The Chi-square changes from 11.318 ($p$<.01) in model 1 to 45.572 ($p$<.001) in model 2. Model 2 also shows a better fit with smaller -2 Log Likelihood (-2LL), improved pseudo R-square from .056 to .214 (Nagelkerke R-square). The Hosmer and Lemeshow Test showed no significant difference between the observed events (the data) and the predicted events (the model). This means that the observed and expected values are similar. Moreover, the percentage of correct prediction improves from 70.8% in model 1 to 76.2% in model 2.

Three out of four sets of the antecedent hypotheses were supported. Two out of the three hypotheses on country antecedents were strongly supported. Consistent with the Hypothesis 2b, an increase in host country's economic growth rate increased the likelihood of growth options exercise ($p$<.01). As predicted by Hypothesis 2c, more economic freedom in the host country also significantly increased the likelihood of the growth options exercise ($p$<.05). The industry antecedent hypotheses (Hypotheses 3a and 3b) were also supported ($p$<.05). Low industry concentration (i.e., highly competitive industries) increased the likelihood of the growth options exercise. Ownership concentration also increased the likelihood of the growth options exercise ($p$<.05). Hypotheses 1a and 1b – the nature of the option creation as predictor of the type of options exercise – were not supported.

A supplemental analysis using multinomial logistic regression was performed to explore the differences in the predictive power of the antecedents on the two types of non-growth options: delay and exit. The comparisons of exit and delay options exercise

was done against the base category of growth options exercise. The final multinomial model shows the predictive power of 16%, 13.2%, and 70.8% for the exit, delay, and growth options respectively (Chi-square = 65.676, $p<.001$). Table 3 (page 75) reports the multinomial logistic regression results, which confirmed the previous findings that the host country economic growth rate is negatively related to the likelihood of the exit options exercise ($p<.01$). The economic freedom of the host county was also negatively related to the likelihood of the exit options exercise ($p<.1$). Industry concentration (low competition) strongly increased the likelihood of the exit options ($p<.05$). The multinomial regression finding for the delay options exercise was marginal. Only the host country economic growth rate ($p<.05$) and economic freedom ($p<.1$) were found to have negative relationships with the likelihood of the delay options.

### 5.2 Options Creation and Market Reactions

A sub-sample of the announcements was used in the event studies (Table 4, page 77; Tables 5 and 6, page 80-81) to prevent confounding effects of other announcements during the event period. Announcements with missing returns data during the estimation period and/or the event period were also excluded. The usable data was reduced to 141 announcements. The estimation period of 250 days to 50 days before the event date was used to estimate the expected returns for each company during each event date. Different periods of event windows from one day (Day 0 – announcement day) to eleven days (Day -5 to 5) were analyzed using several parametric tests such as Patell's (1976), Cross-sectional and Boehmers et al. (1991) t-statistics, as well as a nonparametric test of Sign-test statistics.

Table 4 reports the results of the event study analysis on the market reactions to the options creation. The analysis shows some support for Hypothesis 5, which predicted that option creation has a positive effect on the subsequent market reactions. A difference-of-means between the two subgroups of joint venture and wholly-owned initial international investments showed that the two groups are significantly different from each other. Results for a one-day, two-day, three-day, five-day, and eleven-day event windows are summarized in Table 4. The one-day, three-day and five-day windows showed significant positive returns upon the announcements of options creation in the form of joint venture. The one-day and five day windows showed significant negative abnormal returns for the announcements of wholly-owned initial international investment. These significant findings are noteworthy because the results confirmed the idea that joint ventures are a form of options creation. Since partnership can benefit the partners by reducing downside risks of investing abroad, an initial investment in form of a joint venture creates value. Interestingly, wholly-owned investment, which has also been considered by some as real options, yields significant negative abnormal returns. Detailed results will be discussed in the Hypotheses Testing section.

### 5.3 Options Exercise and Market Reactions

Tables 5 and 6 reports the results of event study analysis on the market reactions to the different types of options exercise. Table 5 reports the comparison between the growth and non-growth options exercise subgroups. The overall cumulative abnormal returns for the growth options are positive returns, but not at a significant level. Table 6

presents the comparison between the delay and exit options exercise subgroups. The results showed significant negative abnormal returns for the delay options in the eleven-day window (Day -5 to 5). Significant negative abnormal returns were also found for exit options in the two-day and three-day windows.

Tables 7 and 8 (page 86-87) reports the results of hierarchical moderated regression on the moderating effects of country, industry, and firm specific characteristics on the relationship between the options exercise and market valuation (Tobin's Q).

The relationship between options exercise and Tobin's Q was considered in the first step of the hierarchical regression. Results indicate that the overall model was significant ($F = 12.840$, $p < .001$), predicting 18.9% of the variance in Tobin's Q. The model demonstrates that, as predicted, exit option is negatively associated with Tobin's Q ($\beta = -.09$, $p < .10$), thus providing support for Hypothesis 6c and suggesting that an exit option announcement has a negative effect on firm's market value.

Before examining the moderating effects of the factors proposed in Hypotheses 7-13, the main effects of these variables were controlled for in Step 2 of the hierarchical regression. The model remained significant ($F = 6.869$, $p < .001$), predicting 23.5% of the variance in market valuation. While no direct effects of these factors on market valuation were hypothesized, it was necessary to control for each of them before examining their interactive effects with the type of options exercise in the prediction of market valuation. Model 2 of Table 7 shows that two of the seven main effects are exhibiting a significant influence on market valuation. The host country political risk is

negatively associated with market valuation (β = -.35, $p < .001$). Additionally, low level of economic freedom is negatively associated with market valuation (β = -.25, $p < .05$). While neither of these direct effects was hypothesized, results indicate that as host country conditions become unfavorable (increased political risk, decreased economic freedom), the market value of the firm operating in that host country also decreases.

The interaction terms were added in Model 3, Step 3 and Table 7 contains the results of the hierarchical regression analysis testing all hypothesized moderating relationships on exit and delay options. The main effect coefficients are not reported in this model as they become uninterpretable once the moderating effects are entered. The overall model remains significant (F = 3.433, $p < .001$) and the change in $R^2$ is .025. The total $R^2$ for this model is .260, indicating that the variables are explaining 26.0% of the variance in market valuation. Because the change in $R^2$ is not significant, examination of the individual coefficients is inappropriate to test the hypothesized moderating relationships. Similar results of insignificant change in $R^2$ were also found when entering the interaction terms in separate blocks of country factors, industry factor, and firm factors. Each of these relationships will be discussed in the Hypotheses Testing section.

## 5.4 Supplemental Analysis

A supplemental hierarchical moderated regression analysis was performed. The focus was on the moderating effects of country, industry, and firm specific characteristics on the relationship between the type of options creation and subsequent market valuation. The results are summarized in Table 9 on page 90. Model 1 shows the

main effect of the nature of options creation on market valuation. Model 2 reports the effects of the contextual factors on market valuation. Model 3 shows the interaction effects of the moderators and the options creations on the market valuation. All three models are significant at the level of $p<.001$. Total R-square for Model 1, 2 and 3 are .200, .281 and .325. Change in R-square are also significant at $p<.001$ for Model 1 and Model 2. Model 3 showed the significant change in R-square at $p<.05$.

## TABLE 1 Descriptive Statistics and Correlations

| | Mean | S.D. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Market Valuation (Tobin's Q) | 2.33 | 2.08 | 1.00 | | | | | | | | | | | |
| 2. Exit Options | 0.16 | 0.37 | -.11* | 1.00 | | | | | | | | | | |
| 3. Delay Options | 0.13 | 0.34 | -.02 | -.17** | 1.00 | | | | | | | | | |
| 4. Growth Options | 0.71 | 0.46 | .11* | -.68** | -.61** | 1.00 | | | | | | | | |
| 5. Nature of Options Creation | 0.67 | 0.47 | -.06 | -.08 | .01 | .06 | 1.00 | | | | | | | |
| 6. Firm Size | 23.94 | 1.61 | -.02 | .12* | .06 | -.14* | .01 | 1.00 | | | | | | |
| 7. Firm Age | 27.75 | 21.87 | -.12* | .15** | .11* | -.21** | .10* | .48** | 1.00 | | | | | |
| 8. Prior Performance | 2.41 | 2.02 | .42** | -.05 | -.04 | .07 | .20** | -.06 | -.13* | 1.00 | | | | |
| 9. Political Risk | 64.92 | 24.12 | -.19** | .08 | .02 | -.09 | .05 | -.19** | -.03 | .03 | 1.00 | | | |
| 10. Economic Growth Rate | 5.03 | 3.21 | -.02 | -.18** | -.10* | .22** | -.03 | -.13* | -.09 | .09 | -.09 | 1.00 | | |
| 11. Economic Freedom | 2.98 | 0.95 | .12* | -.16** | -.08 | .19** | .10 | .18** | .03 | .04 | -.82** | .29** | 1.00 | |
| 12. Industry Concentration | 0.65 | 0.17 | .15** | -.02 | .11* | -.07 | .15** | .11* | -.25** | .03 | -.24** | -.06 | .15** | 1.00 |
| 13. Cash Flow | $5.0x10^4$ | $2.2x10^5$ | -.06 | .19** | -.08 | -.10* | -.17** | .53** | .23** | -.05 | -.20** | -.09 | .10* | -.04 |
| 14. Executive Change | 0.14 | 0.34 | .03 | -.03 | .07 | -.03 | -.06 | -.09 | -.06 | -.01 | .00 | .13* | -.04 | .07 |
| 15. Unique Experience | 6.72 | 8.94 | .02 | .09 | -.06 | -.03 | -.01 | .33** | .35** | -.19** | -.12* | -.09 | .00 | -.04 |
| 16. Ownership Concentration | 32.90 | 17.35 | .16** | -.17** | .10* | .07 | .11* | .05 | -.12* | .23** | -.01 | -.06 | .02 | .43** |

** $p < .05$*
*** $p < .01$*

**TABLE 1 – *Continued.***

| | 13 | 14 | 15 | 16 |
|---|---|---|---|---|
| 1. Market Valuation (Tobin's Q) | | | | |
| 2. Exit Options | | | | |
| 3. Delay Options | | | | |
| 4. Growth Options | | | | |
| 5. Nature of Options Creation | | | | |
| 6. Firm Size | | | | |
| 7. Firm Age | | | | |
| 8. Prior Performance | | | | |
| 9. Political Risk | | | | |
| 10. Economic Growth Rate | | | | |
| 11. Economic Freedom | | | | |
| 12. Industry Concentration | | | | |
| 13. Cash Flow | 1.00 | | | |
| 14. Executive Change | -.08 | 1.00 | | |
| 15. Unique Experience | .32** | -.05 | 1.00 | |
| 16. Ownership Concentration | -.05 | .19** | -.28** | 1.00 |

** $p < .05$*
*** $p < .01$*

## 5.5 Hypotheses Testing

### *5.5.1 Hypotheses 1a and 1b*

Hypotheses 1a and 1b predicted the relationship between the nature of the options creation and the type of the options exercise. Hypothesis 1a predicted that joint venture will have a negative relationship with the likelihood of growth option exercise and that the wholly-owned initial investment will have a positive impact on the likelihood of growth option. Examination of Model 2 of Table 2 shows that the nature of options creation is not significantly predicting the growth option exercise ($\beta$ = -.322, $p$ = .337). Further analysis of multinomial logistic regression (Table 3) also shows that the nature of options creation is neither significantly predicting the exit ($\beta$ = -.320, $p$ = .447) nor the delay ($\beta$ = -.310, $p$ = .493) options. Therefore, hypotheses 1a and 1b are not supported.

### *5.5.2 Hypotheses 2a, 2b and 2c*

The next set of hypotheses predicted the relationship between host country antecedents of political risk, economic growth rate and economic freedom, and the type of options exercise. Hypothesis 2a predicted that the higher political risk will increase the likelihood of non-growth options (exit or delay). The result from binary logistic regression in Table 2 shows that political risk is not a significant predictor of the growth option ($\beta$ = .007, $p$ = .553). The result from multinomial logistic confirms that the political risk factor is neither a significant predictor of exit ($\beta$ = .001, $p$ = .955) nor delay ($\beta$ = -.016, $p$ = .289) options. Consequently, Hypothesis 2a is not supported.

Hypothesis 2b predicted that the host country economic growth rate will have a positive impact on the decision to expand the initial investment. Table 2 shows that the economic growth rate is a significant predictor of the growth option exercise (β = .120, $p$ = .005). The multinomial logistic regression result in Table 3 also shows that the economic growth rate is negatively related to the exit (β =-.134, $p$ = .013) and delay (β = -.109, $p$ = .036) options. Thus, Hypothesis 2b is supported.

Hypothesis 2c predicted that the host country economic freedom is positively related to the likelihood of the growth options. Both results from the binary and multinomial logistic regression show that economic freedom positively related to the growth option (β = .688, $p$ = .024), and negatively related to the exit (β = -.631, $p$ = .100) and delay (β = -.761, $p$ = .059) options exercise. Therefore, Hypothesis 2c is supported.

*5.5.3 Hypotheses 3a and 3b*

The next two hypotheses predicted the relationship between industry concentration and the type of options exercise. Hypothesis 3a predicted that a low industry concentration will increase the likelihood of the growth option exercise. Table 2 shows that the industry concentration is significantly related to the growth option (β = -2.534, $p$ = .021). Thus, Hypothesis 3a is supported. Table 3 shows that industry concentration is significantly related to the exit option (β = 2.661, $p$ = .051), but is not significantly related to the delay option (β = 1.998, $p$ = .190). Therefore, Hypotheses 3b is partially supported.

*5.5.4 Hypotheses 4a, 4b, 4c and 4d*

The last set of predictor hypotheses examines the relationship between firm-specific characteristics and the type of options exercise. Hypothesis 4a predicted that the level of cash flow will increase the likelihood of the growth options. Neither the results from Table 2 nor Table 3 shows any significant findings for cash flow as a predictor. Consequently, Hypothesis 4a is not supported.

Hypothesis 4b predicted that executive change wll have a negative impact on the decision to expand the initial investment. In other words, executive changes will decrease the likelihood of growth options exercise. Again, the binary and multinomial logistic regression results show no significant findings for the relationship between executive change and the type of options exercise. Therefore, Hypothesis 4b is not supported.

Hypothesis 4c predicted that firm's unique experience in terms of years of international operation will increase the likelihood of growth option. There was no significant finding to support this hypothesis.

Hypothesis 4d predicted that ownership concentration will have a positive relationship with growth option. The binary logistic regression result in Table 2 supported this hypothesis ($\beta = -.019$, $p = .047$). Also, the multinomial logistic regression shows that ownership concentration is negatively related to the exit options exercise ($\beta = -.040$, $p = .002$), but no significant finding for the delay options ($\beta = .005$, $p = .712$). Thus, Hypothesis 4d is partially supported.

**TABLE 2 Binary Logistic Regression Results**

| Variables | Model 1 | | Model 2 | |
|---|---|---|---|---|
| Constant | 3.205 | (2.146) | 1.151 | (3.082) |
| Control | | | | |
| Firm Size | -.085 | (0.093) | -.084 | (0.124) |
| Firm Age | -.014* | (0.007) | -.019 | (0.008) |
| Prior Performance | .058 | (0.073) | .024 | (0.082) |
| Country Antecedents | | | | |
| Political Risks | | | 0.007 | (0.011) |
| Economic Growth Rate | | | 0.120** | (0.043) |
| Economic Freedom | | | 0.688* | (0.305) |
| Industry Antecedents | | | | |
| Industry Concentration | | | -2.534* | (1.101) |
| Firm Antecedents | | | | |
| Cash Flow | | | 0.011 | (0.018) |
| Executive Change | | | 0.315 | (0.415) |
| Unique Experience | | | 0.022 | (0.020) |
| Ownership Concentration | | | 0.019* | (0.010) |
| Nature of Options Creation | | | -.322 | (0.335) |
| | | | | |
| Chi-square | 11.318** | | 45.572*** | |
| -2 Log Likelihood (-2LL) | 328.000 | | 203.746 | |
| Nagelkerke R-square | .056 | | .214 | |
| Correct Prediction (%) | 70.800 | | 76.200 | |

N = 281 Standard deviation values are in parentheses.
*$p<.05$
**$p<.01$
***$p<.001$

**TABLE 3 Multinomial Logistic Regression Results**

| Variables | Exit Option | Delay Option |
|---|---|---|
| Constant | .123 (3.979) | -4.456 (3.851) |
| Control | | |
| Firm Size | -.013 (0.163) | .220 (0.163) |
| Firm Age | .019$^{\dagger}$ (0.010) | .017 (0.009) |
| Prior Performance | .028 (0.099) | -.110 (0.123) |
| Country Antecedents | | |
| Political Risks | .001 (0.015) | -.016 (0.015) |
| Economic Growth Rate | -.134$^{**}$ (0.054) | -.109$^{*}$ (0.052) |
| Economic Freedom | -.631$^{\dagger}$ (0.396) | -.761$^{\dagger}$ (0.402) |
| Industry Antecedents | | |
| Industry Concentration | 2.661 (1.362) | 1.998 (1.523) |
| Firm Antecedents | | |
| Cash Flow | -.012 (0.011) | .001 (0.014) |
| Executive Change | .564 (0.515) | .315 (0.415) |
| Unique Experience | -.008 (0.024) | .022 (0.020) |
| Ownership Concentration | -.040 (0.013) | .019$^{*}$ (0.010) |
| Nature of Options Creation | -.320 (0.421) | -.310 (0.453) |
| | | |
| Chi-square | 65.676$^{***}$ | |
| -2 Log Likelihood (-2LL) | 280.180 | |
| Nagelkerke R-square | .261 | |

N = 281 Standard deviation values are in parentheses.
$^{\dagger}p<.10$
$^{*}p<.05$
$^{**}p<.01$
$^{***}p<.001$

*5.5.5 Hypothesis 5*

The relationship between options creation and market reactions was predicted in Hypothesis 5. Table 4 shows the event study results which partially support the hypothesized positive abnormal returns. Joint venture options creation showed a significant positive abnormal return of 5.6% on the day of the announcement (Day 0 $p<.05$). In the three-day event window (Day -1 to 1), joint venture also showed significant positive abnormal return of 8.6% ($p<.05$). Five-day window (Day -2 to 2) showed significant positive abnormal return of 2.1%. Wholly-owned initial investment has a negative abnormal return of -2.5% on the announcement date, and -3.2% abnormal return on the five-day window (Day -2 to 2). Z value for a difference-of-means test between the two subgroups of joint venture and wholly-owned investment showed that the two groups are significantly different at $p<.05$ level. Several sub-samples were used to test Hypothesis 5 including a sub-sample size of 39 options creation announcements for eleven-day window, 52 for five-day window, and 72 for three-day window. These different sub-sample sizes yield similar results as the one reported in Table 4. Since only joint venture initial investment showed positive significant returns, Hypothesis 5 is partially supported.

**TABLE 4 Average Abnormal Returns upon Options Creation**

| Event Window | Joint Ventures as Options Creation | | | | | Wholly-owned Investment as Option Creation | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | AAR | (+) AR | Sign-test | BMP[a] | $Z^b$ | AAR | (+) AR | Sign-test | BMP[a] | $Z^b$ |
| -1 to 0 | 0.036 | 50.00% | 0.000 | 1.145 | -1.169 | -0.041 | 30.77% | -1.372 | -0.330 | -1.169 |
| 0 | 0.056 | 53.58% | 0.392 | 1.766* | -2.739* | -0.025 | 23.08% | -1.941* | -2.646* | -2.739* |
| -1 to 1 | 0.086 | 61.54% | 1.177 | 1.867* | -1.877* | -0.091 | 30.77% | -1.387 | -0.827 | -1.877* |
| -2 to 2 | 0.021 | 69.23% | 1.961* | 1.742* | -1.169 | -0.032 | 46.15% | -0.277 | -0.260* | -1.169 |
| -5 to 5 | 0.057 | 61.54% | 1.177 | 1.071 | -0.708 | -0.098 | 46.15% | -0.277 | -0.026 | -0.708 |

N=39: Joint Venture = 26; Wholly-owned=13.

[a] BMP is Boehmer et al.'s (1991) standardized cross-sectional statistics. Similar results were also obtained using Patell's (1976) t-statistics and cross-sectional t-statistics tests.

[b] *Z* is the Wilcoxon *Z* test for a difference of means between the two subgroups

*$p$<.05

*5.5.6 Hypotheses 6a, 6b and 6c*

This set of hypotheses examines the relationship between the types of options exercise and the subsequent market reactions. Hypothesis 6a predicted that the exercised growth options will yield a positive market reaction. Table 5 reports the growth options to be associated with a positive abnormal return, but is not at a significant level. Therefore, Hypothesis 6a is not supported.

Hypothesis 6b predicted that the exercised delay options will yield a negative market reaction. An examination of the results in Table 5 indicates that the non-growth options are significantly related to negative abnormal returns at the two-day window (Day -1 to 0, $p<.05$), and at the three-day window (Day -1 to 1, $p<.05$). Moreover, further examination of the results ( Table 6) showed that, when the non-growth options are separated into delay and exit, the -9.6% abnormal returns are significant in the subgroup of delay options announcements at the eleven-day window (Day -5 to 5, $p<.05$). Thus, Hypothesis 6b is supported.

Hypothesis 6c predicted that the exercised exit option, which is one of the non-growth options, will yield a negative market reaction. Again, results from Table 5 showed support by indicating that the non-growth options are significantly related to the negative abnormal returns (Day -1 to 0 and Day -1 to 1, $p<.05$). Further examination of the exit options subgroup in Table 6 confirmed the yield of significant negative abnormal returns at the two-day window (-9.57%, $p<.05$) and at the three-day window (-8.64%, $p<.05$). Also, the result from hierarchical moderated regression (Table 7,

Model 1, Step 1) shows that exit options yield negative market reactions ($\beta$ = -.09, $p$ < .10). Accordingly, Hypothesis 6c is supported.

**TABLE 5 Average Abnormal Returns upon Options Exercise (Growth vs. Non-growth)**

| Event Window | Growth Options Exercise AAR | (+) AR | Sign-test | BMP[a] | $Z^b$ | Non-growth Options Exercise AAR | (+) AR | Sign-test | BMP[a] | $Z^b$ |
|---|---|---|---|---|---|---|---|---|---|---|
| -1 to 0 | 0.028 | 48.10% | -0.338 | 0.585 | -1.206 | -0.078 | 32.00% | -1.800 | -1.790* | -1.206 |
| 0 | 0.035 | 45.57% | -0.788 | 0.479 | 0.101 | -0.015 | 48.00% | -0.200 | -0.178 | 0.101 |
| -1 to 1 | -0.014 | 44.34% | -1.013 | -0.520 | -1.307 | -0.051 | 32.00% | -1.800 | -2.152* | -1.307 |
| -2 to 2 | 0.027 | 48.10% | -0.338 | -0.059 | -0.817 | -0.023 | 44.00% | -0.600 | -1.008 | -0.817 |
| -5 to 5 | 0.016 | 50.63% | 0.113 | 0.167 | -2.031 | -0.060 | 28.00% | -2.200 | -2.495 | -2.031 |

N=102: Growth Options = 77; Non-growth=25. Non-growth cumulative abnormal returns = -.077(-2.25*).

[a] BMP is Boehmer et al.'s (1991) standardized cross-sectional statistics. Similar results were also obtained using Patell's (1976) t-statistics and cross-sectional t-statistics tests.

[b] *Z* is the Wilcoxon *Z* test for a difference of means between the two subgroups

*$p$<.05

**TABLE 6 Average Abnormal Returns upon Options Exercise (Delay vs. Exit)**

| Event Window | Delay Options Exercise | | | | | Exit Options Exercise | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **AAR** | **(+) AR** | **Sign-test** | **BMP[a]** | ***Z*[b]** | **AAR** | **(+) AR** | **Sign-test** | **BMP[a]** | ***Z*[b]** |
| -1 to 0 | -0.061 | 38.46% | -0.832 | -1.293 | -0.218 | -0.096 | 25.00% | -1.732 | -1.837* | -0.218 |
| 0 | -0.029 | 46.15% | -0.277 | -0.514 | 0.435 | 0.015 | 50.00% | 0.000 | 0.520 | 0.435 |
| -1 to 1 | -0.083 | 46.15% | -0.277 | -0.850 | -0.871 | -0.086 | 16.67% | -2.309* | -2.189* | -0.871 |
| -2 to 2 | -0.095 | 53.85% | 0.277 | -1.005 | -0.054 | -0.048 | 33.33% | -1.155 | -0.441 | -0.054 |
| -5 to 5 | -0.096 | 23.08% | -1.941* | -2.212* | 1.197 | -0.161 | 33.33% | -1.155 | -0.678 | 1.197 |

N=25: Delay Options = 13; Exit=12. Non-growth cumulative abnormal returns = -.077(-2.25*).

[a] BMP is Boehmer et al.'s (1991) standardized cross-sectional statistics. Similar results were also obtained using Patell's (1976) t-statistics and cross-sectional t-statistics tests.

[b] *Z* is the Wilcoxon *Z* test for a difference of means between the two subgroups

*$p<.05$

*5.5.7 Hypotheses 7a, 7b and 7c*

Hypotheses 7-13 examine the moderating effects of country, industry, and firm factors on the relationship between the options exercise and the market valuation or Tobin's Q. Hypothesis 7a predicted that political risk will have a negative moderating effect on the relationship between the growth options and the market valuation. Hypotheses 7b and 7c predicted that political risk will have a negative moderating effect on the delay and exit option respectively. The results in Table 7 and 8 showed that the interaction effects of political risk with the three types of options have no significant effect on the market valuation. Therefore, Hypotheses 7a, 7b, and 7c are not supported.

*5.5.8 Hypotheses 8a, 8b and 8c*

This set of hypotheses predicted the moderating effects of the economic growth rate on the relationship between the type of options exercise and the market valuation. Hypothesis 8a predicted that the economic growth rate of the host country will have a positive moderating effect on the growth options and the market valuation relationship. The results in Table 8 showed that the interaction terms of economic growth rate and the growth options exercise have no significant effects on the market valuation. Hypothesis 8a is not supported.

Hypothesis 8b predicted that the economic growth rate of the host country will have a negative moderating effect between the delay option and market valuation relationship. Table 7 showed that the economic growth rate and the delay options

exercise interaction term has no significant effect on the market valuation. Hence, Hypothesis 8b is not supported.

Hypothesis 8c predicted that the economic growth rate of the host country will have a negative moderating effect in the relationship between the exit option and market valuation. No significant interaction effect between the economic growth rate and the exit options exercise was found in Table 7. So, Hypothesis 8c is not supported.

*5.5.9 Hypotheses 9a, 9b and 9c*

The relationship between the economic freedom and the type of options exercise was predicted by Hypotheses 9a-c. Hypothesis 9a predicted that the economic freedom will have a positive moderating effect on the relationship between the growth options and market valuation. Table 8 showed no significance effect of the hypothesized relationship. Hypothesis 9a is not supported.

Hypothesis 9b predicted that the relationship between the delay option and market valuation will be negatively moderated by the level of economic freedom of the host country. The results from Table 7 showed no such significant effect. Thus, Hypothesis 9b is not supported.

Hypothesis 9c also predicted that economic freedom will negatively moderate the relationship between the exit option and market valuation. Similar to Hypothesis 9b, Table 7 results provided no support for Hypothesis 9c.

*5.5.10 Hypotheses 10a, 10b and 10c*

This set of the hypotheses predicted the moderating effects of competition level in the industry on the relationship between the type of options exercise and market

valuation. Hypothesis 10a predicted that the high competition level (low industry concentration) will have a negative moderating effect on the growth option and market valuation relationship. Again, the results in Table 8 shows no significant moderating effect, and thus, Hypothesis 10a is not supported.

Hypotheses 10b and c predicted the positive moderating effects of competition level on the delay and exit options exercise and the market valuation relationships. These two hypotheses also find no support in Table 7.

*5.5.11 Hypotheses 11a, 11b and 11c*

Next, the level of firm's cash flow was predicted to have moderating effects on the relationship between the types of options exercise and the market valuation. Hypothesis 11a predicted a positive moderating effect of cash flow on the growth options and market reaction relationship. Hypotheses 11b and 11c predicted the negative moderating effects of cash flow on the delay and exit options and market valuation relationships. None of the cash flow hypotheses are supported.

*5.5.12 Hypotheses 12a, 12b and 12c*

This set of hypotheses predicted that executive change will have a negative moderating effect on the growth options' relationship with the market valuation. Positive moderating relationships were predicted for the delay and exit options' relationship with the market valuation. No support was found for Hypotheses 12a, 12b, and 12c.

*5.5.13 Hypotheses 13a, 13b and 13c*

This set of hypotheses predicted the moderating effects of firm's unique experience in terms of years of international operation experience. Low level of experience in the international market is predicted to have a negative moderating effect on the growth options model and a positive moderating effect on the delay and exit option models. No support was found for these hypotheses.

**TABLE 7 Regression of Options Exercise on Market Reactions (Exit and Delay)**

| | Model 1 | Model 2 | Model 3 |
|---|---|---|---|
| | β | β | β |
| **Step 1.** | | | |
| Exit Options Exercise | -.09† | | |
| Delay Options Exercise | -.02 | | |
| Firm Size | .05 | | |
| Firm Age | -.07 | | |
| Firm Prior Performance | .41*** | | |
| **Step 2.** | | | |
| Political Risk | | -.35*** | |
| Economic Growth Rate | | .06 | |
| Economic Freedom | | -.25* | |
| Industry Concentration | | -.01 | |
| Firm Cash Flow | | -.06 | |
| Executive Change | | -.03 | |
| Unique Experience | | .04 | |
| **Step 3.** | | | |
| Exit Options * Political Risk | | | -.89 |
| Exit Options * Economic Growth Rate | | | -1.21 |
| Exit Options * Economic Freedom | | | -1.00 |
| Exit Options * Industry Concentration | | | -.91 |
| Exit Options * Firm Cash Flow | | | -.20 |
| Exit Options * Executive Change | | | -.30 |
| Exit Options * Unique Experience | | | -.56 |
| Delay Options * Political Risk | | | -.20 |
| Delay Options * Economic Growth Rate | | | .40 |
| Delay Options * Economic Freedom | | | .03 |
| Delay Options * Industry Concentration | | | -1.00 |
| Delay Options * Firm Cash Flow | | | .97 |
| Delay Options * Executive Change | | | -.58 |
| Delay Options * Unique Experience | | | -.13 |
| Total $R^2$ | .189 | .235 | .260 |
| Adjusted $R^2$ | .175 | .201 | .184 |
| Full Model F | 12.840*** | 6.869*** | 3.433*** |
| df | 275 | 268 | 254 |
| $\Delta R^2$ | .189*** | .046* | .025 |

† $p < .05$
* $p < .05$
** $p < .01$
*** $p < .001$

## TABLE 8 Regression of Options Exercise on Market Reactions (Growth)

| | Model 1 β | Model 2 β | Model 3 β |
|---|---|---|---|
| **Step 1.** | | | |
| Growth Options Exercise | .07 | | |
| Firm Size | .05 | | |
| Firm Age | -.07 | | |
| Firm Prior Performance | .41*** | | |
| **Step 2.** | | | |
| Political Risk | | -.36*** | |
| Economic Growth Rate | | .06 | |
| Economic Freedom | | -.25* | |
| Industry Concentration | | -.02 | |
| Firm Cash Flow | | -.07 | |
| Executive Change | | -.03 | |
| Unique Experience | | .04 | |
| **Step 3.** | | | |
| Growth Options * Political Risk | | | .41 |
| Growth Options * Economic Growth Rate | | | .12 |
| Growth Options * Economic Freedom | | | .40 |
| Growth Options * Industry Concentration | | | .02 |
| Growth Options * Firm Cash Flow | | | -.03 |
| Growth Options * Executive Change | | | .07 |
| Growth Options * Unique Experience | | | .10 |
| Total $R^2$ | .186 | .234 | .247 |
| Adjusted $R^2$ | .174 | .202 | .195 |
| Full Model F | 15.792*** | 7.463*** | 4.766*** |
| df | 276 | 269 | 262 |
| $\Delta R^2$ | .186*** | .0048* | .013 |

† $p < .05$

* $p < .05$

** $p < .01$

*** $p < .001$

*5.5.14 Supplemental Analysis*

The supplemental analysis of the relationship between the nature of options creation (joint venture vs. wholly-owned initial investment) and market valuation and the moderating effects of the contextual factors shows some significant effects. Table 9 summarizes this supplemental, hierarchical regression analysis. The overall model significance for Model 1 – the nature of options creation main effect model, Model 2 – the contextual factors main effect on Tobin's Q, and Model 3 – interaction effects between the nature of option creation and contextual factors on Tobin's Q, are all significant at $p < .001$ level. Changes in R-square for all three models are also significant ($\Delta R^2 = .200$, $p < .001$, $\Delta R^2 = .081$, $p < .001$, and $\Delta R^2 = .044$, $p < .05$, respectively).

First, the results in Table 9 showed that joint venture option creation has a significant positive relationship with market valuation ($\beta = .14$, $p < .05$). In addition, some of the contextual factors showed significant effects on market valuation. More specifically, the host country political risk level has a negative relationship with market valuation ($\beta = -.22$, $p < .05$). Firm's cash flow level ($\beta = .15$, $p < .05$) and international experience ($\beta = .14$, $p < .05$) also showed significant main effects with market valuation. The moderating effect of industry concentration on the relationship between joint venture and market valuation is significantly negative ($\beta = -.64$, $p < .05$). The moderating effect of executive changes also is significantly positive on market valuation ($\beta = .15$, $p < .10$).

*5.5.15 Summary*

A summary of all findings is presented in Table 10 on page 91. Chapter VI will discuss the implications of these findings and the conclusions that can be drawn based on these results. Study limitations and directions for future research in the area will also be provided.

## TABLE 9 Regression of Options Creation on Market Reactions

| | Model 1 β | Model 2 β | Model 3 β |
|---|---|---|---|
| **Step 1.** | | | |
| Options Creation (Joint Venture = 1 Wholly-owned = 0) | .14* | | |
| Firm Size | .04 | | |
| Firm Age | -.06 | | |
| Firm Prior Performance | .44*** | | |
| **Step 2.** | | | |
| Political Risk | | -.22* | |
| Economic Growth Rate | | -.07 | |
| Economic Freedom | | -.04 | |
| Industry Concentration | | .10 | |
| Firm Cash Flow | | .15* | |
| Executive Change | | .02 | |
| Unique Experience | | .14* | |
| **Step 3.** | | | |
| Options Creation * Political Risk | | | .28 |
| Options Creation * Economic Growth Rate | | | -.05 |
| Options Creation * Economic Freedom | | | -.07 |
| Options Creation * Industry Concentration | | | -.64* |
| Options Creation * Firm Cash Flow | | | .07 |
| Options Creation * Executive Change | | | .15† |
| Options Creation * Unique Experience | | | .10 |
| Total $R^2$ | .200 | .281 | .325 |
| Adjusted $R^2$ | .189 | .252 | .279 |
| Full Model F | 17.284*** | 9.571*** | 7.005*** |
| df | 276 | 269 | 262 |
| $\Delta R^2$ | .200*** | .081*** | .044* |

† $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

## TABLE 10 Summary of Findings

| | Predictor Variable | Dependent Variable | Findings |
|---|---|---|---|
| **H1a** | Joint Venture Options Creation | Type of Options Exercise | No Support |
| **H1b** | Wholly-owned Options Creation | Type of Options Exercise | No Support |
| **H2a** | Political Risk | Type of Options Exercise | No Support |
| **H2b** | Economic Growth Rate | Type of Options Exercise | Support |
| **H2c** | Economic Freedom | Type of Options Exercise | Support |
| **H3a** | Industry Competition | Growth Options Exercise | Support |
| **H3b** | Industry Competition | Non-growth Options Exercise | Partial Support |
| **H4a** | Financial Performance | Type of Options Exercise | No Support |
| **H4b** | Executive Changes | Type of Options Exercise | No Support |
| **H4c** | International Experience | Type of Options Exercise | No Support |
| **H4d** | Ownership Concentration | Type of Options Exercise | Partial Support |
| **H5** | Options Creation | Market Reactions | Partial Support |
| **H6a** | Growth Options | Market Reactions | No Support |
| **H6b** | Delay Options | Market Reactions | Support |
| **H6c** | Exit Options | Market Reactions | Support |
| **H7a** | Growth Options * Political Risks | Market Valuation | No Support |
| **H7b** | Delay Options * Political Risks | Market Valuation | No Support |
| **H7c** | Exit Options * Political Risks | Market Valuation | No Support |
| **H8a** | Growth Options * Economic Growth Rate | Market Valuation | No Support |
| **H8b** | Delay Options * Economic Growth Rate | Market Valuation | No Support |
| **H8c** | Exit Options * Economic Growth Rate | Market Valuation | No Support |
| **H9a** | Growth Options * Economic Freedom | Market Valuation | No Support |
| **H9b** | Delay Options * Economic Freedom | Market Valuation | No Support |
| **H9c** | Exit Options * Economic Freedom | Market Valuation | No Support |
| **H10a** | Growth Options * Industry Competition | Market Valuation | No Support |
| **H10b** | Delay Options * Industry Competition | Market Valuation | No Support |
| **H10c** | Exit Options * Industry Competition | Market Valuation | No Support |
| **H11a** | Growth Options * Financial Performance | Market Valuation | No Support |
| **H11b** | Delay Options * Financial Performance | Market Valuation | No Support |
| **H11c** | Exit Options * Financial Performance | Market Valuation | No Support |
| **H12a** | Growth Options * Executive Changes | Market Valuation | No Support |
| **H12b** | Delay Options * Executive Changes | Market Valuation | No Support |
| **H12c** | Exit Options * Executive Changes | Market Valuation | No Support |
| **H13a** | Growth Options * International Experience | Market Valuation | No Support |
| **H13b** | Delay Options * International Experience | Market Valuation | No Support |
| **H13c** | Exit Options * International Experience | Market Valuation | No Support |

# CHAPTER VI

# DISCUSSION

The previous chapter presented the results of the data analysis and hypotheses testing of this research study. Chapter VI is divided into four sections. The first section addresses and integrates the findings regarding predictors of the type of the exercised options. The second section focuses on the implications of the relationship between real options and market reactions and the variables which may intensify or weaken this relationship and relevant conclusions and implications based on the current findings. Limitations of the present study are discussed in the third section and the final section of this chapter provides suggestions for future research in the area of real options as international investment strategies and the outcome in terms of firm's value and market reaction.

## 6.1 Options Exercise Antecedents

When MNEs enter into an investment in a new foreign market, the main purpose is to gain profit from that investment. Since several investment opportunities can coexist, firms usually test the water by investing in stages in order to reserve their resources. The initial investments are executed by firms in hope of future expansion after the management has the opportunity to learn more about the uncertain external and internal factors involving that project. These stages of investment can be considered as

real options creation and real options exercise (Rosenberger & Eisenhardt, 2003). Once real option has been created through the initial investment, the option should be exercised not too long after the first stage. The rationale behind this argument is from the transaction cost viewpoint to maximize the use of resources in order to maximize profit and ensure that the often limited resources are in good use, and that idle resources are redirected into other investment projects with more potential. Therefore, it would be beneficial for management to correctly forecast whether the subsequent expansion is possible once the uncertainties become more known.

The results of the predictor model in this study indicate that positive changes in host country conditions in terms of the economic growth rate and economic freedom increase the likelihood of subsequent expansion (i.e., growth options). As host country economy grows, growth options become more likely. Less host-country government intervention, and thus, more economic freedom also increase the likelihood of growth options to be exercised. These characteristics of a host country attract MNEs to expand their business abroad.

In term of the industry factor, increased competition level within the industry also pressures firms to be more competitive and have a positive influence on the decision to expand. As the industry becomes more fragmented with no clear market leaders, the playing field becomes level and firms compete fiercely in this type of market. New creative ways and expansion into new markets are utilized to compete and survive in this type of industry. The result from the predictor model confirms the influence of the industry competition.

Firm conditions also affect the subsequent growth strategy. While firm financial performance, top management and international experience have been hypothesized and proven to affect the FDI decision in the past, the result of this study did not confirm such relationships. Possible explanations for why these hypotheses were not supported will be discussed in the limitation section. The results, however, supported the prediction on the effect of ownership concentration on the decision to grow. Higher concentration of the ownership means that owners have tighter control over firm's strategies, and thus, ensure that further expansion proceeds as planned in a timely manner.

### 6.2 The Relationship between Options Creation and Market Reactions

Globalization brings about significant increase in international investment and FDI. MNEs are under increasing pressure to perform and grow internationally. Although gaining a foothold in the market abroad to learn from experience is an important, and often necessary step, spreading out risks by not investing in a lump sum seems wise, especially in this increasingly uncertain and dynamically changing international arena. The purpose of creating a real option is for firm to reserve the right, but not an obligation, to exercise the growth option in the future. By staging the investment, firms can reserve resources and approach the new international investment with a wait-and-see attitude. Once uncertainties regarding the host country, the industry, and the firm condition become clearer, management can decide on whether to pursuit growth within that market. Therefore, an announcement of staged initial investment –

options creation, should yield a positive market reaction. The results show partial support that options creation is desirable.

International joint venture is another form of real option creation (Kogut 1991; Reuer & Tong 2005). In this case, firms reduce downside risk by sharing cost and risk with one or more partners. Moreover, partnerships can also create synergies that enable firms to utilize their complementary skills to achieve common goals. Therefore, the initial investment in the form of joint venture should receive more positive market reaction as compared to wholly-owned investment. The results confirmed that options creation, especially joint ventures, increase firm's value, and hence positive market reactions.

### 6.3 The Relationship between Options Exercise and Market Reactions

As mentioned earlier, the idea behind staging an investment in a new foreign market is that future expansion is preferable. Thus, an announcement of further expansion (growth options) should yield positive market reaction. Along the same line of argument, the non-growth options exercise reflects somewhat of a miscalculation by the management, although it may not be as devastating as the failure of a lump sum investment. Thus, negative market reaction is expected after such announcements. The event studies results supported the prediction that the non-growth announcement yields negative returns. However, the growth announcement did not receive the hypothesized positive market reaction. The explanation can be drawn from the Agency Theory (Jensen & Meckling, 1976) that overexpansion by managers is not in the best interest of the shareholder. Thus, market may view expansion announcement as a decrease in

future dividend pay and is less valuable to the shareholder. Exit options are more severely punished by the market. This may be due to the fact that an exit from an investment is a sign of failure, regardless of how small the investment may be.

## 6.4 Influence of Contextual Factors

Host country factors are a very real influence on multinational expansion strategies. Different political, economic, and legal systems increase the uncertainty factor for MNEs when operating abroad. Although none of the country factor hypotheses finds any support, the fact remains that this set of contextual factors cannot be ignored.

Industry effect has long been known to influence firms' strategies. Competition from rival firms forces them to become more aggressive in their expansion strategies. The fact that the present study did not find support for the industry measure can stem from methodological issues of measures and sample size.

The moderating effects of firm specific characteristics did not find support in this study. The firm financial, management, and experience aspects were tested as moderators, but showed no significance. Again, this may be attributable to the sample characteristics as explained below.

While these moderating effects were not supported in this study, it appears that the nonfinding may mainly be due to the disproportionate size of the sub-sample groups (199 growth, 45 exit, and 37 delay option announcements). Since the three types of option announcements were analyzed and compared against each other (e.g., delay and exit against growth, and growth against non-growth options) in the hierarchical

moderated regression, such an unequal size sample may be making the proposed interaction difficult to find. Also, the size of two out of the three subgroups is relatively small. Aggregated measures in the model may also lead to the lack of significant results.

### 6.5 Moderating Effects of Contextual Factors

Supplemental analysis showed some support for main effects and the moderating effects from the hierarchical moderated regression analysis and the event studies. Joint venture, as expected, was found to yield significant positive abnormal returns. The results confirmed the idea that real options generate positive financial impact on firm's value (e.g., McGrath et al. 2004). The hypothesized moderating effects of real options and market reaction found some support in this analysis. Host country political risk has a significant positive main effect on the market reaction. As previously discussed, higher political risk leads to uncertainty, and real options creation, therefore, creates value. Higher level of cash flow also has a positive direct effect on the market reactions. Investment for future growth and profit, in this case, is viewed as having positive impact on the firm. International experience is also positively related to the market reactions. The more international experience MNEs has, the more confidence the market has on firm's venture to become successful in the future.

The moderating effects of some of the contextual factors were also confirmed. Joint venture in a highly competitive industry (low industry concentration) was found to create positive value. This makes sense because in highly uncertain environment, real options to reduce risk and uncertainty are valuable strategies. Joint ventures after recent changes in executive position are also considered to have positive value because such

big changes within the internal conditions can also bring about a level of uncertainty. Real options creation, again, creates value.

## 6.6 Limitation of the Study

Real options research in the management field has been focused primarily on theoretical issues and is lacking in empirical studies. This may be due to the difficulty in the lack of uniformly agreed upon real options classification. The variables involved in real options are also quite complicated to measure (e.g., market reactions and option values – Tobin's Q or returns on the stocks). Likewise, the main limitations of this study involve methodological issues. Market valuations as measured by Tobin's Q may not truly capture the impact of tested moderators. The disparate size of the subgroups (119 growth, 45 exit, and 37 delay options exercise) may have caused the nonfinding in the moderating effect testing. Since hierarchical regression was used to compare the subgroups, big differences in the sample sizes can make detection of differences difficult. As previously mentioned, non-growth subgroups are significantly smaller than the growth options sample.

One of the possible reasons for not finding significant moderator effects may be due to the use of Tobin's Q as a proxy for the market valuation. Although Tobin's Q has been utilized in previous research (e.g. Lee & Makhija, 2003) to capture market reactions, this measure is not actually a change measure. Using a real market reaction (i.e. event studies) for this sample has also been a challenge in terms of reduced sample size to control for confounding effects from other announcements and missing data.

Unfortunately, a more appropriate measure that can capture change in market's perception of the firm's value is not currently available.

The difference between the joint venture investment and wholly-owned investment in event study analysis could have been further explored if the full information about these investments were available. For example, the size of investment as a percentage of total company worth could have been investigated to see whether this is the underpinning reason for the negative market reactions to the wholly-owned investment announcements. Since most joint venture announcement did not disclose the investment amount, such an analysis was not possible.

The focus of this study is on emerging market environment because recent issues of the *Academy of Management Journal* and the *Academy of Management Review* have been calling for more studies in the international and emerging market settings. Sample for this study is comprised of Thai multinational firms listed in the Securities Exchange of Thailand. Since it is a single-country sample, generalizability of the significant results to other countries are limited. There is a tradeoff between generalizability issues when using a single-country sample and confounding effects when including data from more than one country. More specifically, Thai market reaction was used in this study because of the data accessibility and accuracy issues. Obtaining information from English version of the real options announcements had been a challenge because of inaccuracy in translation. This shortfall was remedied by going back to the Thai version of the announcements. Critical information, such as whether firm has decided to invest or just looking at the possibilities of investing in the

future, was often lost in translation. Future studies should include data from multiple markets when accuracy of the information can be ensured.

Market efficiency or the lack thereof is also another limitation of this study. Since the study focuses on an emerging market, the market efficiency in terms of available information to investors is lacking as compared to more established markets such as the NYSE. However, based upon previous literature, real options should increase more value to the firms that face highly uncertainty environments. Moreover, investing internationally by MNEs in developed markets may not yield as big of a reaction from investors as when an emerging-market MNEs go abroad since it may be perceived as common.

Other limitations include the aggregate measures of economic freedom which was highly correlated with the political risk measures. The economic freedom index is a fairly new measure that incorporates several economic and political aspects of a country. This may have interfered with the ability to find significant country factors moderating effects. While the emerging market is an ideal condition to study real options because of its relatively higher uncertainty level than the more stable markets, the market imperfections in the emerging Thai market can also cause market reactions to become more unpredictable. The study of a single market can be a limitation in terms of generalizability. However, there is a tradeoff between the generalizability and the ability to control confounding effects from incorporating market reactions from several markets.

## 6.7 Suggestions for Future Research

Larger sample size should be used to study the moderating effects of the proposed contextual factors. Samples from other emerging markets and/or more stable markets can be used to compare the results of market reactions of options creation and exercise. Different market behaviors can be investigated to see which conditions are more suitable for real options creation and exercise.

Other measures for country, industry, and firm specific characteristics can be used to test the proposed moderating effects. Other measures of an increase in firm's value from real option factors should be analyzed. Research can also be expanded to include other aspects of these contextual factors. For example, the moderating effects of firm ownership identity (e.g., government, family, or investment institution as major shareholders, etc.) may yield interesting results on the market reactions of real options.

Since real options studies in management are still mainly theoretical, empirical research to test real options theories can tremendously contribute to the literature in this field. More predictors of the type of subsequent options exercise can also be examined. Exploring the cost and benefits of other types of options (e.g., options to contract the investment, etc.) is also a promising stream of research. More specific measures of options value, firm value, and market reactions that can effectively exclude influences of other factors, will significantly contribute to the empirical advancement in this area. Study of confounding effects of multiple projects of real options creation by an MNE should also be examined to see whether such strategies create value to the firm.

## 6.8 Managerial Implications

Although real options allow managers to capture the upside gain and reduce the downside risk of international expansion by staging the investment, managers need to be more careful about creating the real options. Results from this study indicate that exit options are still considered undesirable by the market. International expansion through subsequent growth options exercise, however, has no significant effect on firm's value. In addition, the ability to accurately forecast the outcome of the initial investment based upon the changing external and internal conditions may be a valuable tool for managers to plan ahead accordingly.

## 6.9 Conclusion

This research has argued that real options creation and growth options exercise have positive relationships with market reactions and that external and internal factors influence these relationships. Furthermore, contextual factors affect the outcome of the subsequent exercised options. Before managers jump on the real options bandwagon, careful considerations and realistic investigation of the potential of the new foreign markets must be made prior to the market entry commitment. Using real options as an excuse to excessively expand can result in a negative outcome. Real options enable firm to capture the upside gain, while reducing downside risk. However, the intention to enter and grow in new market must be made realistically and analytically. Exiting from the investment, after all, is still considered as a failure.

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