DYNAMICS OF MULTINATIONAL RIVALRY

A Dissertation

by

TIEYING YU

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2003

Major Subject: Management

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Approved as to style and content by:

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ABSTRACT

Dynamics of Multinational Rivalry. (August 2003)

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Drawing insights from strategic management and international business literature, the present study develops an integrated model to explain the competitive actions between multinational firms in a global context. Accordingly, two research questions are addressed: What key factors explain the competitive actions of multinational firms? What key factors moderate the competitive tensions experienced by different pairs of multinational firms? Using structured content analysis to identify competitive actions, the empirical findings of the present study suggest that subsidiary control, MNE size, national culture, government regulations and multimarket contact are all likely to exert important impact on a multinational firm's motivation and capability to compete and therefore influence its competitive aggressiveness in foreign markets.

DEDICATION

To my father.

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First of all, I wish to express my sincere gratitude to my advisor Bert Cannella. Bert, your enthusiasm, guidance and support have inspired me throughout my time at Texas A&M University, and will continue to do so throughout my career. I am eternally grateful that you agreed to chair my dissertation committee two years ago. During that time, I was very confused and frustrated about continuing my Ph. D. program. However, you succeeded in making the process interesting and enlightening.

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Finally, I wish to thank my family—my parents, brother and sisters, and husband, Han Lei, for their enduring patience and understanding. Dad, I know you are watching and hope my efforts are making you proud!

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CHAPTER I

INTRODUCTION

MOTIVATION AND RESEARCH QUESTIONS

As more and more firms start to do business internationally, multinational rivalry[1] has naturally emerged as a field of interest among researchers in different disciplines (Ghoshal, 1987). Consequently, a large body of work has explored topics such as market entry (Buckley & Casson, 1998; Davis, Desai, & Francis, 2000), foreign direct investment (FDI) (Graham, 1990; Knickerbocker, 1973) and technology diffusion (Gupta & Govindarajan, 2000; Kim & Kogut, 1996) of multinational enterprises (MNEs). Despite the important insights provided by prior studies, our understanding of the competitive action of MNEs remains very limited.

Focusing on the competitive actions of MNEs, the overriding objective of the present study is to develop a framework to understand multinational rivalry and conduct competitor analysis in an international context. The basic premise is that multinational rivalry can be best understood through studying the competitive actions of MNEs across national markets. This conceptualization offers researchers a concrete and manageable way to examine the complex phenomenon of global competition, moving beyond anecdotal and case-based explorations of this important topic (Chen & Stucker, 1997).

This dissertation follows the style and format of the *Academy of Management Journal*.
[1] In this dissertation, multinational rivalry, global competition, international competition and cross-border competition were used interchangeably.

Compared with domestic competition, the competitive interaction between MNEs is more complicated for several reasons. First, organizational considerations such as information availability and subsidiary control become more critical. Firms from different national cultures, for instance, might not be able to correctly interpret each other's competitive signals. The headquarters of many MNEs might not have sufficient control over their local subsidiaries to execute corporate level competitive strategies (Martinez & Jarillo, 1989; Nohria & Ghoshal, 1994).

Second, market conditions across countries are different, in contrast to a more homogenous home market (Yip, 1995). Constraints on MNEs can be imposed by geographical distance, cultural diversity and varying government regulations (Gupta & Govindarajan, 1991). As a result, the critical elements of markets in a global setting are significantly different from those in a domestic market. For instance, industrial concentration and entry barrier are two factors widely used by scholars to explain interfirm rivalry in a domestic competition. However, in a multinational context, these factors might not be sufficient to capture the diverse market dynamics across country markets. Instead, cultural, economic and political characteristics associated with each national institutional environment become critical in shaping the competitive actions of MNEs.

Finally, as noted by White and Eccles (1987:984), competition is a "tangible social construction" defined by the rivals involved. To identify who competes with whom, one must carefully investigate those contextual factors that allow these definitions to persist (Porac, Thomas, Wilson, Paton, & Kanfer, 1995). When two firms compete

internationally, the change of environment may reshape their competitive relationship. For instance, Ford and General Motors are tit-for-tat competitors in the U.S. However, when they enter the Japanese market, the restrictions to which they are both subject are likely to motivate them to lower the competitive intensity against each other to certain degrees in order to get more bargaining power from the Japanese government.

Recognizing the important differences between domestic and global competition, the basic motivation of this dissertation is to build an integrated model to understand multinational rivalry. In doing so, it is helpful to draw from extant research in the literature that not only examines oligopolistic competition in a global context (Buckley & Casson, 1976; Dunning, 1981; Hennart, 1982), but also delves into the antecedents and consequences of interfirm rivalry (Chen, 1996; Smith, Grimm, & Gannon, 1992).

In strategic management, one research stream has significantly inspired the present study. Labeled competitive dynamics or the action-and-response perspective, some scholars using the individual competitive move as the unit of analysis investigate the characteristics of competitive action and response, their interaction, and their impacts on interfirm rivalry and organizational performance. The idea of competitive dynamics holds great promise for conceptualizing multinational rivalry. As Hamel and Prahalad (1985:140) note, "what drives global competition" is the exchange of competitive moves. Furthermore, competitive dynamics research has identified three drivers of interfirm rivalry—awareness, capability and motivation—which can be naturally applied to the analysis of global competition (Chen & MacMillan, 1992). The present study uses constructs such as subsidiary control, cultural distance and government regulations to

explain the competitive actions of MNEs, primarily because these factors exert a direct or indirect impact on an MNE's motivation and capability to compete against its rival across markets.

Despite its promising implications for multinational rivalry, competitive dynamics research suffers from one major limitation. With very few exceptions, "the market" examined is a homogeneous domestic market. The implicit assumption of market homogeneity and cultural commonality, which has been reinforced by studies that focus on highly homogeneous domestic industries, has greatly restricted the explanatory power of this research stream (Chen & Stucker, 1997).

In addition to competitive dynamics research, strategic interaction theory in the international business literature has also contributed substantially to the theory development of this study. Strongly influenced by Industrial Organization Economics, the work in this stream argues that a firm's decision to expand internationally (mainly in terms of FDI) depend both on its own capabilities and the behavior of its rivals. Emphasizing the competitive interdependence between multinational competitors, strategic interaction theory uses two models—exchange of threat and follow the leader—to explain oligopolistic rivalry across borders. Strategic interaction theory has provided great insights to the present research. However, due to its strong economics focus, strategic interaction theory has largely ignored firm-specific assets in understanding MNE foreign expansion.

Since there remains a significant gap in both the strategic management and the international business literature, the need for developing a theory of multinational rivalry

is of paramount importance. Drawing insights from various theoretical perspectives, this dissertation extends previous competition study by addressing the following research question:

What key factors explain the competitive actions of MNEs across national markets?

Focusing on the differences between national markets as well as between competitors of different country origins (Porter, 1990), the present study investigates the antecedents of multinational rivalry. Consequently, some firm and market specific constructs such as subsidiary control, cultural distance and government regulations are suggested to have significant impacts on the competitive actions of multinational firms.

First, from an organizational point of view, for MNEs operating in diverse national markets, an efficient coordination and control mechanism between different subsidiaries and between subsidiaries and headquarters is critical. For example, consider one multinational firm A competing in two foreign countries X and Y. Based on competition theory and strategic business unit (SBU) literature (Golden, 1992; Jayachandran, Gimeno, & Varadarajan, 1999), to effectively implement competitive strategy, firm A should make its administrative units in both country X and country Y willing and capable of coordinating their actions. In the absence of such intrafirm coordination, global competition converges to market-by-market competition, which might not be optimal for the overall firm performance. Most of previous research has ignored firm differences with respect to the implementation capability of competitive strategy. In the present study, however, using the equity holding structure as a way to capture the degree of control an

MNE headquarters has over its subsidiaries, the importance of subsidiary coordination and control in shaping an MNE's competitive behavior is highlighted.

Besides subsidiary control, national culture is expected to play a significant role in multinational rivalry as well. Despite its theoretical importance, the concept of cultural distance has not been applied to the study of competitive behavior. In filling this gap, the present research explains how cultural distance between rivals as well as between home and host markets are both key antecedents and moderators of MNE competitive actions. On the one hand, cultural similarity between two rivals helps them correctly interpret each other's intentions and therefore increases their ability to undertake aggressive actions. On the other hand, when firms compete across countries, differences in national cultures lead to ambiguities in understanding and difficulties in transferring management practices (Kostova & Zaheer, 1999). As a result, when an MNE competes in a country market culturally similar to its homeland, the easier and more effective resource and information flow between the headquarters and the subsidiary will increase the subsidiary's capability to take competitive initiatives.

Finally, from a market point of view, each national market has its own trade, economic and political idiosyncrasies that may shape the competitive action of MNEs (Bartlett & Ghoshal, 1987). Concentrating on government regulations on MNEs' operation, the present study explores the role of the institutional environment in shaping multinational rivalry. Although previous research has already examined the effect of contextual factors such as industry dynamism on interfirm rivalry, as indicated earlier, there are important differences between the key elements of markets in domestic and

global settings. When firms compete internationally, they may use policy measures of their home governments as parts of their competitive strategies. Government protection offers home firms an opportunity to shape the competitive environment in such a way as to improve their position against foreign rivals. Moreover, a highly protected host environment is also likely to redefine the competitive relationships between two foreign rivals. Instead of competing aggressively, they may choose to reduce the competitive intensity against each other in order to have a stronger voice when negotiating with the host government.

In addition to the first research question, the present study also investigates the competitive asymmetry between MNEs. Consequently, the first research question is extended as follows:

What key factors moderate the competitive tensions experienced by different pairs of MNEs across national markets?

Chen (1996) argued that, although all firms may compete simultaneously with each other in the same market, a firm will experience different degrees of competitive tension—the extent to which a focal firm would compete more aggressively with a given competitor—from each of its competitors. As an important topic for competitor analysis, competitive asymmetry, the notion that a given pair of firms may not pose an equal threat to each other, has attracted increasing attention from strategic management researchers. For instance, Gimeno (1999) found that a firm competed less aggressively with a rival which had an important foothold in the firm's important markets. Chen (1996) showed

that a firm competed more aggressively with a rival with similar resource endowment and common market profile.

Despite all these interesting findings, little effort has been devoted to examining the competitive asymmetry in an international context. In contrast, the present study captures the asymmetric competitive dynamics existing between different pairs of MNEs through investigating factors that play important roles in global competition. For example, country of origin—as the key to carry out global research is identified as a critical moderator of pair wise competitive tensions between MNEs. The competitive dynamics between Toyota and Honda could be quite different from those between Toyota and Volvo. The cultural similarity may help Toyota and Honda clearly interpret each other's competitive signals and therefore undertake fast competitive movements.

CONTRIBUTION

Overall, this dissertation contributes to the literature in the following three ways. First, it extends the study of competition in the game theory and strategic management literature by taking into account the important differences between domestic and global competition. In a multinational setting, cultural and geographic distance compounded by varying market contexts make the implicit assumptions of existing competition study---market homogeneity and cultural commonality--very problematic. Taking a multidisciplinary approach, the present study attempts to fill this gap by developing an integrated framework to explain the competitive action of MNEs. Theoretically and empirically, this research is one of the very few that have explicitly explored the impact of

government regulations, subsidiary control and cultural distance on firm competitive activity.

Second, current research on multinational rivalry in the international business field has paid little attention to the varying competitive dynamics existing between different pairs of MNEs. In the strategic management literature, although the idea of competitive asymmetry has generated significant interest from a small group of scholars, as indicated above, little of this interest has been extended to an international context. The present study on the other hand, refines previous research by examining the antecedents of asymmetric competitive relationships in global competition.

Finally, by advancing the current literature of global competition from a collection of anecdotes to a multidisciplinary framework with rigorous data analysis and testing, the present study is one of the first empirical works on multinational rivalry in the strategic management field. Using structured content analysis to identify competitive moves between competitors, nine hypotheses are tested with a very rich database on the global automobile industry.

Equally important, the present study retests theoretical arguments of existing competition research in a global setting. This not only helps us gain further understanding about the validity of these research streams, but also provides empirical evidence about the contingencies that might make previous theoretical predictions more or less likely to occur in a multinational context.

OVERVIEW OF THE RESEARCH METHOD

Theory and hypotheses developed in the present study were tested using a sample of 13 global auto manufacturers from 1995 through 2001. The selection of this research sample comes from both theoretical and pragmatic concerns. Theoretically, it is desirable to study competitive dynamics in an industry that has intense competitive interaction among an identifiable and manageable set of industrial participants. The oligopolistic market structure of the global automobile industry and its clearly defined industry boundary make it a good fit for the present study. Moreover, the 13 companies being selected by the present study jointly account for 88 percent of world motor vehicle production (*Ward's Automotive Yearbook*, 2002), which indicates that the research sample well represents all the major players in the industry. Pragmatically, the time period chosen to study ensures the availability of data needed to test the theory and hypotheses suggested.

Data were collected from various archival sources. The complete database includes information on competitive actions between MNEs, government regulations in different national markets, and some other firm and environmental characteristics. Consistent with previous research, the competitive actions of MNEs in different countries were identified using structured content analysis. A feasible generalized least squares regression analysis was employed to test the hypotheses generated from the theoretical framework of this study.

ORGANIZATION OF THE DISSERTATION

The remainder of this dissertation is organized as follows: relevant research streams about interfirm rivalry and global competition in game theory, strategic management and international business literatures are reviewed in Chapter II. The chapter points out both contributions and limitations of previous research on multinational rivalry and sets the stage for the theoretical framework developed in Chapter III. In Chapter III, a theoretical model of multinational rivalry is developed. Six focal elements—subsidiary control, MNE size, cultural distance between competitors, cultural distance between home and host markets, government regulations and multimarket contact—are used to explain the competitive actions carried out by multinational rivals. In Chapter IV, based on the model suggested in Chapter III, nine hypotheses are developed. Chapter V presents the research methods used for hypothesis testing. Sample selection, measurement of variables and statistical analysis techniques are discussed. Research findings are provided in Chapter VI. Chapter VII presents discussion of the results reported in Chapter VI. Implications and limitations of this dissertation are deliberated, and future research directions are offered in the end.

CHAPTER II

LITERATURE REVIEW

The early work on multinational rivalry done primarily in the 1970s focused on the location choice and entry mode of FDI. Scholars such as Kindleberger (1969), Caves (1971), Vernon (1971), Horst (1974), Knickerbocker (1973) and Graham (1978), simply viewed global competition as an extension of oligopolistic rivalry across borders. Strongly influenced by industrial organization economics, these researchers illustrated the dynamics of global competition using constructs such as entry barriers, competitive signaling and preemptive investment. The work of the early 1970s has laid a foundation for theory development of reciprocal dumping (Yu & Ito, 1988), strategic trade policy (Brander & Spencer, 1981; 1985; Krugman, 1987) and cross-subsidization (Hamel & Prahalad, 1985). Although over decades, multinational rivalry has been widely recognized as important by researchers in different disciplines, the very few recent studies that have been conducted lack a clear examination of the interactive process of competition between MNEs (Enright, 1993; Waston, 1982). Therefore, much more remains to be done in building a theoretical framework to further investigate the driving forces of global competition.

This chapter reviews relevant research streams about interfirm rivalry and global competition. In the first section, studies pertaining to interfirm rivalry in the game theory, competitive dynamics and multimarket competition literatures are discussed. In the

second section, theories and empirical evidence of the antecedents and consequences of global competition are reviewed.

Overall, the objective of this chapter is to demonstrate the limitations of previous alternative theories and models vis-à-vis the present research. The chapter concludes by arguing that there is great promise in using well-established theory on interfirm rivalry to analyze global competition.

INTERFIRM RIVALRY

Research in Game Theory

Competition has been a focal point of study for oligopoly theory in industrial organization economics. Focusing on competitive interaction, oligopoly theory uses mathematical models to denote equilibrium outcomes and payoffs associated with alternative actions and responses. Cournot (1838), Bertrand (1883) and Edgeworth (1925) established the foundations of oligopoly theory and discussed the central issue of how prices would be formed in a market with only a few competitors. In doing so, they preceded non-cooperative game theory in developing solution concepts for situation of strategic interaction.

It is precisely the interaction between game theory and oligopoly theory that made possible the formalization of important ideas about competition in industrial organization contexts. As the distinguished feature of "new industrial organization" economics, game theory has contributed important tools to research in different disciplines (Vives, 1999). Following lists a few models that are influential in the literature and a brief explanation of

some of these models can also be found in Table 2.1 (All tables and figures in this study appear in Appendix A).

For dynamic games of complete information, subgame-perfect equilibrium (SPE), a refinement of Nash equilibrium by Selten (1965) is central in game theory. For games of incomplete information, Harsanyi (1967) introduced the important concept of Bayesian Nash equilibrium (BNE). For dynamic games of incomplete information, Selten (1975)'s perfect equilibrium and Kreps and Wilson (1982b)'s sequential equilibrium are both very influential. With regard to the theory of repeated games pioneered by Friedman (1971), Aumann and Shapley (1976) provided important tools for analyzing the mechanisms to nourish collusion using credible threats. Finally, allowing for imperfect monitoring of firm actions, Green and Porter (1984) explained the role of price wars in sustaining collusion and the necessary condition to prevent secret price cutting.

In general, research in game theory focuses on prescribing an optimal solution for a player from a set of action variables, with a basic premise that payoffs of various actions are interactive in nature. Put differently, a firm's payoff or profit, for any given strategic choice, is jointly determined by its own actions and the actions of its competitors. In choosing among different strategic alternatives, a firm has to cautiously consider the likely future action of its rivals. At the same time, the firm's action can also affect its rivals' beliefs and corresponding return-maximizing behavior. Hence, compared with most models in traditional industrial organization economics, game theory is more micro and dynamic by nature.

Game theory, as a language to describe strategic interaction, has been used to analyze many strategic issues. For instance, taking insights from the sequential equilibrium model developed by Kreps and Wilson (1982a) and Milgrom and Roberts (1982), Smith, Grimm and Cannon (1992) empirically examined the relationship between a firm's reputation and the characteristics of its competitive response. Moreover, applying a game theory approach on market signaling to understanding competitors' intentions and goals, Ferrier (1997) explored the impact of overt signaling (tough talk) on market share erosion. Although researchers in strategic management have devoted substantial effort to using game theory to explain many strategic issues, the work that has been conducted so far is still very limited. Several reasons might explain this situation.

First, game theory emphasizes theoretical perfection, mathematical elegance and rigorous modeling. These goals have generally been achieved at the expense of the relevance of the business problems under study. For instance, Kreps (1990) noted that, many examples of competitive interaction are too rich and full of possible moves and countermoves to be modeled by game theory which requires very precise and simplified specification.

Second, multiple equilibria are common in game theory models, and there is often no satisfactory way to choose a single equilibrium outcome. Achieving an equilibrium solution generally requires strong assumptions about players' objectives and tendencies. However, players may quite rationally take very different courses of action which would not lead to an equilibrium (Kreps, 1990).

Third, most game theory research assumes players behave in a rational manner. However, in practice, strategies always emerge from a trial-and-error learning process in which players continuously adjust their choices based on past experience. In addition to perfect rationality, social norms, conventions and unique firm-specific factors are all likely to influence a firm's strategic action. Although scholars in evolutionary game theory (Samuelson, 1997) and behavioral game theory (Camerer, 2001) have already begun to study these less-than-rational behaviors, much more remains to be done before these cutting-edge models can actually be applied to strategic management research.

Research in Strategic Management

Research in strategic management has also explored the issue of interfirm rivalry. Two major streams appear in the literature. The first —competitive dynamics—using the individual competitive move as the basic unit of analysis, investigates the characteristics of competitive action and response, their interaction and their impacts on interfirm rivalry and organizational performance. The second —multimarket competition—highlights the significance of shared market contacts in reducing competition intensity. Multimarket rivals can strategically use their mutual recognition of potential retaliation[2] in various markets when formulating competitive strategy.

Overview of Competitive Dynamics

Schumpeter (1950)'s theory of "creative destruction" aptly describes head-to-head rivalry between firms as "an incessant race to get or to keep ahead of one another"

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[2] In this dissertation, retaliation and response were used interchangeably.

(Kirzner, 1973: 20). Especially in hyper-competitive markets, incumbent firms are relentlessly pursued by existing and unforeseen challengers that aggressively fight for competitive advantages in the marketplace (D'Aveni, 1994; Schumpeter, 1950). So, to stay ahead, the incumbent firms must actively find new ways of doing things and new things to do (Kirzner, 1973: 20).

Building on this view of aggressive competitive interaction, researchers in the competitive dynamics literature have deliberately examined the active, energetic and primarily purposeful process by which firms interact with each other. MacMillan, McCaffrey and Van Wijk (1985) were the first to use an action-and-response perspective when they explored competitor's responses to easily imitated new products in the banking industry. Bettis and Weeks (1987) employed a similar approach when investigating stock market reactions to product rivalry between Polaroid and Kodak in instant photography.

In general, researchers in the competitive dynamics stream have developed theory and empirical methods centering on a fine-grained competitor analysis at four distinct levels of analysis (a chronological overview of the major papers in competitive dynamics appears in Table 2.2). First, this group of work focuses on the individual action-response dyad (Chen, Smith, & Grimm, 1992). Scholars have investigated the antecedents of competitive action and response using factors such as the attributes a) of the action, b) of the actor, c) of the responder, and d) of the competitive environment (See Figure 2.1). Second, this stream of research has demonstrated a link between action and performance by aggregating the characteristics and frequency of specific action and response over a finite time period—the action-year (Ferrier, Smith, & Grimm, 1999; Smith et al., 1992;

Young, Smith, & Grimm, 1996) or action-month (Makadok, 1998). Research at this level of analysis has shown that the more actions a firm carried out and the greater the speed of execution, the better its profitability and market share. Third, in this research stream, strategy has been viewed as a sequence of competitive actions undertaken by a firm in a given year (Ferrier, 2001; Ferrier et al., 1999). Accordingly, a firm's competitive move was defined as an ordered, uninterrupted sequence of repeatable competitive action events. Fourth, research at this level of analysis has examined the type and timing of competitive actions and their influence on performance within a moving window of observation (Bettis & Weeks, 1987). Firms that responded quickly to new product introductions, for example, were in fact found to have stock market returns superior to new product first movers.

Due to the dynamic nature of interfirm rivalry, an important task of competitive dynamics research has been identifying predictors of competitive attack and response. Various factors in the competitive dynamics literature have been used to explain the competitive exchange between firms. For instance, Chen and MacMillan (1992) used irreversibility of action and competitor dependence on the challenged market to predict rival firms' response. Focusing on four characteristics of the initial action: competitive impact, attack intensity, implementation requirement and type of action, Chen, Smith and Grimm (1992) suggested that competitors' responses were influenced by the characteristics of the action that evoked them. Furthermore, collecting data from three diverse industrial environments, Smith, Grimm and Gannon (1992) argued that variation

across industries influenced rivalry primarily through the manner in which competitive information was available to decision-makers.

Among all the studies on competitive dynamics, Chen (1996) notably extended early research by analyzing the structural context before the launch of an attack. His contribution centers around two firm-specific constructs: market commonality developed from the multimarket competition literature and resource similarity derived from the resource-based theory of the firm. Each firm has a unique market profile and strategic resource endowment. A pair wise comparison with a given competitor along these two dimensions may help researchers illuminate the pre-battle competitive tensions between these two firms and predict how they will attack (or respond to) each other.

In addition to studying the manner by which firms act and react in the marketplace, scholars have also examined the relationship between competitive action/response and firm performance. Two studies are worth noting here. Drawing from the Austrian school of economics, Young, Smith and Grimm (1996) presented a dynamic model of competitive activity and performance. They empirically explored the influence of industry level and firm level cooperative mechanisms on firm level competitive activity, and the effect of firm and industry level competitive activity on firm performance.

In another study, Ferrier and Smith (1999) explored the extent to which dethronement and market share erosion are a function of competitive behaviors of industry leaders and their respective number two challengers. They used four characteristics of competitive action carried out by leaders and challengers to explain the

industry leader's decline: total competitive activity, action timing, action repertoire simplicity and competitive dissimilarity.

Theoretically, the action-and-response model suggested by the competitive dynamics research provides a new angle to portray firms' actual competitive behavior in the market place. Its firm specific, pair wise analysis of competitors is able to capture the dynamic interaction of firms as they strive for competitive advantages, because it is at this dyadic level where competitive engagement actually occurs (Chen & MacMillan, 1992) and the "mutual interdependence" of firms is best represented (Porter, 1980:17).

Despite its promising implications, the competitive dynamics research is not without limitations. First, researchers have devoted attention only to competition in a domestic setting. The implicit assumption of market homogeneity and cultural similarity has significantly restricted its explanatory power in a global context.

Second, although the firm level pair wise emphasis of competitive dynamics research represents a critical first step, its dyadic focus should be complemented by some group or structural approaches in which the social nature or the context of competition is considered. As noted by Chen (1996), these contextual (or industry) factors may not be very helpful in predicting which firms are more likely to initiate competitive actions or engage in responses, but they are surely helpful in specifying broad competitive parameters. Especially in a global market, contextual factors such as government regulations and market diversity certainly could exert significant impacts on firm competitive behaviors.

Finally, the action-and-response model needs to be tested in more diverse industry settings. From Table 2.2, we can find that, except for very few studies, most of the work in competitive dynamics has been conducted on the U.S. airline industry. On the one hand, the U.S. domestic airline industry does possess some idiosyncratic features which make it an ideal setting for testing the proposed theory. On the other hand, heavily focusing on one industry affects the generalizability of this research stream.

Overview of Multimarket Competition

The fast growing literature on multimarket competition encompasses three disciplines: strategic management (Barnett, 1993; Baum & Korn, 1996; Chen, 1996; Gimeno, 1994; Gimeno & Woo, 1996; Karnani & Wernerfelt, 1985; Porter, 1980; Smith & Wilson, 1995; Witteloostuijn & Wegberg, 1992), industrial organization economics (Bernheim & Whinston, 1990; Edwards, 1955; Evans & Kessides, 1994; Feinberg, 1984; Feinberg, 1985; Hughes & Oughton, 1993; Mester, 1987; Scott, 1982) and international economics and business (Baer, 1984; Casson, 1987; Hamel & Prahalad, 1985; Hennart & Park, 1994; Knickerbocker, 1973; Pinto, 1986; Yu & Ito, 1988). Since early works pertaining to multimarket competition have already been extensively reviewed by some scholars (Chen & Stucker, 1997; Gimeno, 1994), the present study only focuses on the current multimarket competition research in the strategic management field(see Table 2.3).

Multimarket competition refers to competitive situations in which the same firms compete against each other simultaneously in multiple geographic/product markets. The theory of multimarket competition suggests that the multimarket contact gives a firm the

option to respond to an attack by a rival not only in the challenged market, but also in other markets in which they both compete. Mutual forbearance, a form of tacit collusion in which firms avoid competitive actions against those rivals they meet in multiple markets, is proposed to occur when multimarket contact increases interdependence between competitors and their ability to deter each other (Baum & Korn, 1996; Edwards, 1955; Gimeno, 1994; Karnani & Wernerfelt, 1985). Building on the mutual forbearance hypothesis, some researchers examine the effect of multimarket contact on competition intensity through changes in prices or profits. While others, drawing from population ecology and international business literatures, explore how the pattern of market entry behavior is constrained by mutual forbearance.

The impact of multimarket contact on intensity of rivalry has received the most attention to date. Measuring competition intensity using marketing-related variables such as price cuts, advertisement expenditure or stability of market share (Gimeno & Woo, 1996, 1999), researchers have empirically tested the competition-reduction effect of multimarket contact in a variety of settings. For instance, Heggestad and Rhoades (1978) found a negative relationship between rivalry and inter-market linkages for bank holding companies. Using panel data analysis, Evans and Kessides (1994) showed that in the US airline industry, the multimarket contact was closely associated with high prices (collusion). In addition to the competition-reduction effect of multimarket contact, researchers have also explored certain factors that may moderate the relationship between multimarket contact and interfirm rivalry. Such moderating variables are typically characteristics of a market environment. In the literature, asymmetric territory interests,

resource similarity, firm industrial experiences and inter-firm transfer of learning are all conditions posited to make mutual forbearance more likely to occur (Chen, 1996; Gimeno, 1999; Greve, 2000; Ingram & Baum, 2001; Wegberg & Witteloostuijn, 2001).

In addition to investigating the influence of multimarket contact on competitive intensity, some scholars drawing from population ecology have also examined the outcome of mutual forbearance in terms of market entry behavior. Among which, two papers written by Baum and Korn (1996; 1999) are noteworthy. Different from past research treating multimarket contact as an aggregate property of industries (Hughes & Oughton, 1993), markets (Evans & Kessides, 1994) or firms (Barnett, 1993; Gimeno & Woo, 1996), Baum and Korn (1999) argue that multimarket contact is a property of the relationship between two firms. They emphasize the cross-market nature of multimarket contact by studying the competitor-dyad level at which actual competitive engagement occurs (Chen & MacMillan, 1992). Moreover, in contrast to traditional theory which proposes a linear relationship between multimarket contact and interfirm rivalry, Baum and Korn (1996; 1999) hypothesized an inverted U-shaped relationship between levels of multimarket contact and the intensity of competitive interaction. When multimarket contact between two firms is low, each firm has an incentive to enter the same markets as the other in order to signal its ability to respond to an attack. However, as multimarket contact increases and firms recognize their competitive interdependence, they will avoid entering a new market that is currently occupied by rivals that they have already met in multiple markets.

As a quickly evolving research stream, some of the logic and mechanisms of multimarket competition theory could potentially be applied to the analysis of global competition. Despite its promising theoretical implications, multimarket competition theory has been criticized for the following limitations.

First, there are many ways of defining markets. For instance, a geographic market can be defined as the lowest geographic unit in which a manager has decision-making authority over competitive strategies (Jayachandran et al., 1999). A product market can be a set of goods or services that is created by similar technology and serves similar functions and customers (Abell, 1980). Despite various definitions of market, in the multimarket competition literature, "the market" examined is mainly a homogenous domestic market. Thus, theoretically, it is imperative for scholars to extend multimarket competition research to other contexts, such as product-line, Internet and international rivalry.

Second, multimarket competition research has focused primarily on the overall aggregate effects of mutual forbearance, with only limited effort to exploring the dynamic process in which competitors actually enact their strategies, signal their aggressiveness and defend their reputations via competitive actions and responses (Baum & Korn, 1999; Chen & MacMillan, 1992).

Third, research in multimarket competition implicitly assumes that there is sufficient coordination between product/geographic markets within firms. Hence, by largely ignoring firm differences with respect to implementation capabilities of competitive strategy, researchers have not fully appreciated the scope and potential robustness of the mutual forbearance phenomenon (Golden & Ma, 2003). As noted by

Gimeno and Woo (1999), the appropriate coordination and control mechanisms among different organizational units managing activities in different geographic/product markets are critical for the effectiveness of multimarket strategies. Multimarket competition will lead to mutual forbearance and lower intensity of competition only if each firm achieves effective coordination between the administrative units through certain ownership structure or incentive systems.

GLOBAL COMPETITION

As more and more firms go global, a whole spectrum of tools and viewpoints from various disciplines has been used to examine international expansion of MNEs. Generally, the research in international business suggests that a firm's decision to expand internationally (mainly in terms of FDI) depend both on its own capabilities and on the behavior of its rivals. Transaction cost theory focuses on firm specific assets in explaining the decisions to expand abroad and largely ignores strategic interactions between competing firms (Buckley & Casson, 1976; Dunning, 1981; Hennart, 1982). Conversely, strategic interaction theorists argue that a firm's decision to engage in FDI hinges on the behavior or expected behavior of its rivals (Flowers, 1976; Graham, 1974; 1978; Knickerbocker, 1973). Strongly influenced by industrial organization economics, the impressive work of this stream has inspired enormous studies in strategic management and also contributes substantially to the theory development of the present study. Thus, in this section, first of all I want to review two major models in strategic interaction theory: exchange of threat and follow the leader. Given the oligopolistic setting that MNEs compete in, both models have explicitly explored how oligopolistic rivalry among MNEs

can affect market entry. Despite the insights that strategic interaction theory has brought to the literature, its strong economics focus makes it ignore firm level factors that may lead firms to invest abroad even in the absence of strategic imperatives. Recognizing this limitation, a small group of researchers have already begun to move the level of competitive analysis from industry to firm. These studies share a common interest with this dissertation on firm competitive interactions. So, I will briefly review them in the second part of this section.

An Extension of Oligopolistic Rivalry across Borders

According to strategic interaction theorists, international competition is simply an extension of oligopolistic rivalry across borders. The strategic rationale for FDI can be explained by two different types of behavior: 1) Exchange of threat, which emphasizes that the threat of reciprocal entry may make two MNEs with different country origins refrain from entering each other's home markets; and 2) Follow the leader, which highlights the significance of a parallel international diversification pattern of MNEs from the same country.

Exchange of Threat

This body of work assumes a two country, two player game, and depicts the conditions under which the threat of mutual invasion can stop firms from entering each other's home markets (Brander & Krugman, 1983; Casson, 1987; Graham, 1990). The model of "exchange of threat" has evolved from studying one-shot games, in which cooperation always breaks down due to the prisoner's dilemma (Brander & Krugman, 1983), to studying repeated games, in which any gains from cheating can be offset by

future punishment and therefore a cooperative equilibrium is likely to be achieved (Graham, 1990; Pinto, 1986).

The principle of "exchange of threat" underscores the importance of strategic interdependence in understanding competitive dynamics. Given the extensive research conducted in FDI, one might be surprised by the sparseness of studies in this research stream. Using a game theoretical approach, Graham (1998: 78) suggested that "if Firm B of Country B is able to achieve a positive profit by entering Country A, it has a positive incentive to do so if Firm A of Country A had previously entered its home market (Country B)." And this will hold true even when Firm B does not have any manufacturing or marketing cost advantages over Firm A.

Along the same line, Veugelers (1995) presented a variant of the traditional two country, two player model, in which each firm must pre-commit to a sunk cost interpreted as an R&D cost in order to build advantages in international markets. Veugelers (1995) pinpointed situations in which oligopolistic reactions may dominate and possibly counteract the traditional motives for MNE operation such as location and firm specific advantages.

Finally, Casson (1987) extended previous analysis by specifying the sophisticated rationalization behind cross-subsidization behavior. He noted that, confronting a technologically strong firm in a global market, a technologically weak firm although disadvantaged, is not entirely without power. The weak firm can defend itself, not in its home market being challenged, but through counteracting in the strong firm's home market. The main advantage of cross-subsidization is that it increases the threat power of

the firm. However, when two firms are both able to cross-subsidize, any unilateral threat will unavoidably end in neutralization. As a result, firms have to choose essentially between tacit collusion and bilateral cross-subsidization.

Empirically, the impact of "exchange of threat" has received limited support in the literature. Graham (1974; 1978) examined whether European and Canadian FDI in the U.S. was a response to previous U.S. investment in Europe and Canada. He found positive evidence in industries characterized by high concentration, product differentiation and R & D intensity. However, Graham's work was criticized for a time lag effect. Put aside competitive consideration, simply as an ideal place for FDI, the U.S. market had attracted an increasing number of European investors during the time period under study. Hence, the longer the time lag, the greater the correlation between U.S. investments in Europe and European FDI in the U.S., even in the absence of an exchange of threat effect (Hennart & Park, 1994).

Except for Graham's work, most of the other studies on "exchange of threat" are anecdotal. Watson (1982) reported the example of IBM and Texas Instruments, which moved early to establish product facilities in the Japanese mainframe computer and semiconductor industries to prevent Japanese manufacturers from dominating their markets. Consequently, Japanese companies such as Fujitsu were eager to expand abroad to increase economies of scale to fight with IBM back home. Tsurumi and Tsurumi (1999) used "exchange of threat" to explain Fuji film's early entry into the U.S. market in 1958 and Kodak's takeover of Nagase in 1986 in Japan.

Overall, the model of "exchange of threat" has been criticized for lacking widespread empirical support. Although Graham (1978) did find that firms may respond to foreign entry by investing in the country of foreign entrants, his study did not provide evidence of the "exchange of threat" equilibrium, whereby firms mutually forbear from entering each other's markets because of the expected response. In fact, as noted by Gimeno (1994) and Hennart and Park (1994), whether the threat of mutual invasion can stop competitors' reciprocal entry or instead escalate interpenetration actually depends on many factors that have not been investigated in an "exchange of threat" model, such as the cost of entry, the irreversibility of entry and organizational ability to coordinate strategies globally.

Follow the Leader

The second research stream, which has been called "follow the leader", originates at Harvard with the work of Knickerbocker (1973) in particular. Knickerbocker observed the tendency of U.S. multinationals to quickly imitate FDI movements of their competitors. His dissertation provides the theoretical underpinnings and empirical support for "follow the leader" behavior. Examining the activities of established subsidiaries of 187 U. S. multinationals in 23 countries over 20 years, Knickerbocker found a significant relationship between industry concentration and the incumbents' "bunching" behavior in foreign investment. Entry concentration increases with industry concentration up to a point, then declines. This supports his hypothesis: "follow the leader" behavior should occur only in moderately concentrated industries, not unconcentrated ones or highly concentrated ones. The explanation is that tightly knit oligopolists will have more

incentive to collude instead of directly competing with each other. Only firms in loose oligopolistic industries are sensitive to their rivals' moves and are motivated to react quickly to maintain their competitive parity.

"Follow the leader" behavior was further explored by Baer (1984), who developed a formal model of sequential entry into foreign markets. His major explanatory variables are the number of firms in the industry, the ability of firms to coordinate their output decisions, and the degree of product differentiation. His study empirically showed that "follow the leader" behavior is a consequence of product differentiation, cost advantages and medium levels of collusion.

In contrast to the model of "exchange of threat", the "follow the leader" behavior has received more empirical support. In addition to Knickerbocker (1973), Flowers (1976), Baer (1984) and Encarnation (1987) reported the sequential entry patterns in the semiconductor industry. After NEC—the leading Japanese manufacturer initiated the first FDI into the U.S. market in 1978, Hitachi and Fujitsu moved in 1979 and Toshiba in 1980 and Mitsubishi followed in 1983. Moreover, Yu and Ito (1988) empirically tested the influence of oligopolistic rivalry and some firm and host country related factors on FDI activities in the U.S. tire and textile industries. Their results revealed that in an oligopolistic industry, firms' motivation of FDI is mainly based on the behavior of rivals, however in a very competitive industry, firms usually do not actively counter the competitors' movements. Finally, Terpstra and Yu (1988) investigated the effect of oligopolistic reaction among the top ten and the second ten largest U.S. advertising agencies and they only found a strong "follow the leader" behavior for the first group.

In the literature, the "follow the leader" model was criticized for the following two reasons. First, both Knickerbocker (1973) and Flowers (1976) tested the existence of "follow the leader" behavior by measuring the extent to which foreign entry was clustered in time and regressing it on the concentration ratio of the investor's industry. On the one hand, entry bunching measured by entry concentration index does not necessarily show oligopolistic reaction but simply indicates that all firms are faced with profitable investment opportunities at the same time. On the other hand, a positive relationship between industry concentration ratio and entry bunching may merely reflect the similarity of firms' resources and capabilities, or the institutional tendency of firms to imitate each other (mimetic isomorphism) (Gimeno, 1994). The "follow the leader" model was also criticized for the fact that it did not address the reason why the first firm in an industry goes abroad. Finally, the model implies that the followers will follow the leader's action without considering other factors, which in practice is not very realistic.

Addition of Firm-specific Factors to Oligopolistic Rivalry

Despite the insights that strategic interaction theory has contributed to global competition study, its strong industrial organization economics focus makes it ignore firm specific assets in understanding MNE foreign expansions. Recognizing this gap in the literature, a small group of researchers have started to use many firm level factors in studying multinational rivalry.

For instance, Yu and Ito (1988) presented an empirical analysis of the impact of firm related and host country related factors on oligopolistic rivalry in the U.S. tire and textile industries. They found that the followers in an industry are not following the leader

just because the leader is in the market. Instead they make their decisions based on firm

specific factors such as firm size, R&D knowledge and product related information.

Similarly, another study conducted by Hennart and Park (1994) showed that the Japanese

firms' propensity to manufacture in the U.S. can be explained simultaneously by location,

firm governance structure and strategic interactions.

In addition to studies in international business, the promise of applying strategic

interaction theory to analyzing interfirm rivalry has also attracted the attention of some

strategic management scholars. First, Alcacer (2001) explored the effect of firm rivalry on

location choice in oligopolistic industries under different firm behavioral assumptions and

learning scenarios. There are three central predictions in his model. First, differences in

firm capabilities (modeled as differences in marginal costs) cause differences in location

choices. Second, more capable firms maintain more monopolistic positions since they

deter competitors more easily and are not forced to exit markets when rivals enter. Finally,

the impact of firm capabilities on location choice changes over time. Second, in an

unpublished working paper, Gimeno, Loree and Beal (1999) examined the globalization

of the integrated circuit industry using the lenses of multimarket competition theory. They

suggest that a focal firm tends to mimic the international destination of home country

rivals and foreign rivals that have competitive presence in its home market.

Although researchers in different disciplines have all recognized the potential of

studying multinational rivalry at the firm level, the very few studies that have been

conducted so far lack a clear explanation of the competitive actions of MNEs (Chen &

Stucker, 1997). Most of them are case studies or "international" only in the sense they

examined non-U.S. markets rather than competition across multiple national markets.

Examples include Craig (1996)'s description of the Japanese beer war in the mid 80s and

Doyle, Saunders and Wong (1992)'s study of the differences in competitive strategies

among American, Japanese and British subsidiaries in the U.K. market. Since the

literature has given relatively little attention to the development of a theoretical

framework for understanding rivalry in an international setting, much more remains to be

done in filling this gap.

SUMMARY AND CONCLUSION

This chapter has reviewed the relevant literature of interfirm rivalry and global

competition in game theory, strategic management and international business. These

theories have provided much insight to the analysis of multinational rivalry. However,

they also suffer from their own limitations. For instance, research in international business

depends heavily on industry structural factors and has failed to consider firm specific

characteristics in explaining MNE foreign expansions. With regard to the study of

competition in game theory and strategic management, although it is the most relevant to

the present study, the implicit assumption of market homogeneity and cultural

commonality has greatly restricted the explanatory power of this line of thinking.

In sum, the diversity in the literature discussed in this chapter indicates that no

single theory can effectively guide the course of the present study. In order to fill this gap,

the purpose of this dissertation is to provide a theoretical framework to understand the

competitive actions of MNEs, focusing on important organizational and environmental

characteristics such as subsidiary control, cultural distance and government regulations

that have been largely ignored in domestic competition study.

CHAPTER III

AN INTEGRATED MODEL OF MULTINATIONAL RIVALRY

The purpose of this chapter is to develop a theoretical framework for global competition using a variety of literatures to enrich and refine the study of interfirm rivalry. The basic premise is that multinational rivalry can be best understood through studying the competitive actions of MNEs across various national markets (Chen & Stucker, 1997). Two research questions are addressed : What key factors explain the competitive actions of MNEs across national markets? What key factors cause the asymmetric competitive tensions between different pairs of MNEs? Combining insights from existing theoretical streams, I argue that strong subsidiary control, large MNE size, similar culture value between competitors as well as between home and host markets, favorable host government regulations, strong home government protections and less multimarket contact are all likely to increase an MNE's motivation and capability to compete with its rivals and therefore increase its competitive aggressiveness in a given market. In line with previous research, a market in this dissertation is defined by the geographic border of a country.

This chapter is organized into two sections. Firstly I define competitive action and explain the two dimensions of competitive action being investigated in the present study—action volume and action complexity. Second, I develop an integrated model of multinational rivalry and explore the role of subsidiary control, size, national culture, multimarket contact and government regulations in shaping MNEs' competitive action.

TWO DIMENSIONS OF COMPETITIVE ACTION

Firms constantly undertake offensive and defensive actions in their struggle for competitive advantage. According to the perspective of Austrian economics, organizational action constitutes the critical market process in which frequent aggressive firm action disrupts causal linkages between competitive conduct and performance outcomes established in the market status quo. To have superior performance over time, firms must undertake a series of actions to continuously create and recreate competitive advantage. The study of competitive action is important because it captures the interactive market behavior between firms in their quest for competitive positions in an industry (Caves, 1984; Porter, 1980).

Consistent with previous research, the present study defines competitive action as a specific and detectable competitive move, such as a price cut or new product introduction, initiated by a firm to defend or improve its relative competitive position (Smith, Grimm, Gannon, & Chen, 1991: 61). Moreover, as will be discussed more fully in Chapter V, I categorized competitive actions of MNEs into the following nine categories: pricing action, new product action, marketing action, technology innovation, capacity action, improvement in distribution and after sales service, diversification, international expansion and changes in organizational structure and management systems. Actions being selected by this research include major and less momentous types of decisions as both are essential aspects of most competitive arsenals. There was much overlap between the actions the present study chose and those selected by researchers such as Miler and Chen (1996) and Ferrier, Smith and Grimm (1999).

Given that individual actions comprise the basic building blocks for competitive exchanges between rivals, various dimensions of competitive action have been examined in the existing literature. For instance, Chen, Smith and Grimm (1992) investigated four dimensions of a firm's competitive action: attack intensity, implementation requirements, competitive impact and type of action. Ferrier, Smith and Grimm (1999) examined the impact of four characteristics of competitive aggressiveness that relate to market erosion: total competitive activity, action timing, action repertoire simplicity and competitive dissimilarity.

Despite various dimensions of competitive action that have been explored by prior research, the present study only focuses on two of them—action volume and action complexity. Several factors guide this selection, with the most critical being the particular relevance of these two dimensions to firm competitive aggressiveness and performance. Using total competitive activity to measure the aggressiveness of a firm, Young, Smith and Grimm (1996) observed a positive relationship between a firm's total competitive actions and its performance. Ferrier, Smith and Grimm (1999) echoed Young et al.'s conclusions and showed that market leaders are more likely to experience market share erosion when—relative to challengers—they undertook less competitive moves and carried out simpler repertoires of actions. Together, these studies suggest that action volume and action complexity, as two critical dimensions of competitive action, highlight the differences that are theoretically important to capture a firm's competitive aggressiveness. In the following section, I will discuss these two dimensions in turn.

Action Volume

Action volume is defined as the total number of competitive actions a firm takes in a given country market each year. In general, the greater the number of competitive actions, the greater the competitive aggressiveness (D'Aveni, 1994; Ferrier et al., 1999; Young et al., 1996). Competitive dynamics and Austrian economics suggest that opportunity for profit is the most important incentive for a firm to undertake competitive action (Chen & MacMillan, 1992; Kirzner, 1997; Schumpeter, 1934). A firm that is aggressive in carrying out more competitive actions than rivals will be exploiting more opportunities and closing off the potential for rivals to retaliate. The positive relationship between action volume and organizational performance is empirically supported in the literature. For instance, studying a sample of 1,903 competitive moves undertaken over a nine-year period in the US software industry, Young, Smith and Grimm (1996) found that the firm that undertakes more actions generates a higher level of performance. Similarly, Ferrier, Smith and Grimm (1999) have shown that the difference between market leaders and challengers in their levels of total competitive activity is related to the persistence of market leadership.

As a firm's cumulative competitive activities increase, the firm creates internal organizational assets in the form of skills, routines and knowledge as well as external assets that cross the organizational boundary such as contracts, relationships, brand images and networks (Nelson & Winter, 1982; Porter, 1991). Maintaining or enhancing this important know-how requires continuously undertaking competitive actions, which generates dynamic learning through trial and error as to which combinations of actions

work and which do not. In general, the cost of taking action is lower for the firm that has efficiencies derived form a rich history of prior activity. Moreover, firms with a rich history of competitive activity are also capable of undertaking more moves in a given time period.

Action Complexity

Firms can choose the types of actions they undertake. Some firms carry out a narrow range of actions, and others undertake a broad range of actions (Miller & Chen, 1996). Action complexity is defined as the total number of types of competitive actions taken by a firm in a given country market each year. Consistent with previous literature, firms that undertake a broader set of actions than their rivals are viewed as more aggressive in the present study.

Firms that carry out a broad set of action types are perceived as more capable and, perhaps, as less predictable (D'Aveni, 1994). Schumpeter (1934) described competitiveness as the ability to pursue a range of competitive actions to capture and sustain a lead. Miller and Chen (1996) suggested that competitive complexity can have profound consequences for an organization's ability to deal effectively with the challenges it faces. Past success, market munificence and a lack of exposure to diverse models of rivalry likely cause managers to concentrate on a narrow range of competitive activities; these conditions shape managerial cognitions and they reduce the incentive for managers to search for different ways of doing things or contribute to an ignorance of competitive alternatives (Walsh, 1995). For instance, some managers might become so obsessed with cost cutting that they neglect distribution and after sales services; others might become so

absorbed with expansion that they forget about innovating their products and production processes.

In general, action complexity is a function of search incentives that induce managers to look for and embrace additional ways of competing. Furthermore, it is also a function of managers' knowledge about the different ways of competing and this knowledge can be enhanced by prior experience with various competitive methods and by exposure to a diversity of rivals and clients (Miller, 1993; Miller & Chen, 1996).

AN INTEGRATED MODEL OF MULTINATIONAL RIVALRY

Firm competitive action is at the core of business strategy and competitive positioning. Focusing on the individual competitive action of MNEs, the overriding objective of this dissertation is to develop and test an integrated model of multinational rivalry that describes how important organizational and environmental characteristics give rise to both enabling and constraining forces that influence the competitive aggressiveness of MNEs.

As discussed in previous chapter, competitive dynamics research highlights the importance of individual firm conduct and characteristics in shaping interfirm rivalry, while IO economics extensively explores the effect of some contextual factors such as the level of industrial concentration on the competitive intensity between firms. Drawing insights from these literatures, a number of organizational and environmental characteristics, such as the extent of MNE control over subsidiary, cultural distance between competitors as well as between home and host markets, MNE absolute size, government regulations and the level of multimarket contact, were selected by the present

study to explain the competitive aggressiveness of MNEs along two dimensions—action volume and action complexity(as shown in Figure 3.1). Several factors guide this selection. First, theoretically and empirically, the impact of these constructs on MNE activities were widely supported by previous research. Second and more importantly, all of these constructs are likely to have direct and explicit bearing on the three essential driving forces of a firm's competitive action: 1) factors that influence the awareness of the competitive context and challenges stemming from strategic interdependence, 2) factors that induce or impede the motivation to take an action, and 3) the cognitive and resource-based factors, which influence the firm's capability to take action (Chen, 1996). For instance, government regulation was selected as one critical element of my integrated framework, simply because that it is likely to significantly impact an MNE's motivation and capability to compete in a foreign market. Thus, basically, the present study uses this awareness-motivation-capability framework to link all the independent variables to the aggressiveness of MNE competitive action. In the following sections, I will explain in turn how each of the antecedents of multinational rivalry suggested in this research affects the competitive action of MNEs.

Subsidiary Control

Expanding internationally can provide a firm with additional market access, economies of scale and increased ability to challenge competitors (Gupta & Govindarajan, 2001; Kogut, 1988). In general, a firm can enter a foreign market in a number of ways: wholly owned subsidiary (through either internal venturing or mergers or acquisitions), joint ventures (minority, equal or majority ownership), strategic alliances, technology

licensing, manufacturing collaborations etc. Different forms of entry mode vary in terms of the degree of control that a firm has over its subsidiaries in the local market (Harrigan, 1985). Viewing the MNE as a network of capital, product and knowledge exchanges among subsidiaries located in different countries (Ghoshal & Bartlett, 1990), the present study uses subsidiary control to reflect the degree of equity ownership and the amount of influence that a multinational headquarters can exercise over the operating and strategic decisions of its subsidiaries.

As an efficient way that an MNE headquarters can use to coordinate and modify its subsidiaries' behavior, subsidiary control and its important implications for a wide range of MNE activities have been extensively discussed in the international business literature. For instance, the degree and the pattern of subsidiary control within multinational firms have been found to be a significant predictor of foreign investment performance (Root, 1987; Woodcock, Beamish, & Makino, 1994), capability of knowledge transfer (Kogut, 2000) and level of product differentiation (Anderson & Coughlan, 1987; Caves, 1982).

From a competition point of view, the degree of control that an MNE headquarters has over its subsidiaries can influence the process through which the corporate competitive strategy is executed and the ability of an MNE to make coordinated efforts in competing with other MNEs across national markets (Franko, 1978). An efficient internal control mechanism safeguards the asset and information transfer within an MNE and enables the collective actions of subsidiaries across borders.

Furthermore, different types of subsidiary control can give MNE subsidiaries different motivations to compete. For instance, consider two subsidiaries of General

Motors (GM), one in Mexico is wholly owned by GM; the other in Germany is a joint

venture of GM and a local car manufacturer. When Volkswagen initiates competitive

actions in the territories of both subsidiaries, it is not difficult to understand why the first

one will have more motivation to fight because of the higher pressure or threat it may feel

from this attack.

Taken together, in a global setting, for MNEs operating in diverse national market,

an efficient control and coordination mechanism between an MNE's headquarters and its

subsidiaries is critical for the effectiveness of competitive strategy at the corporate level

(Gimeno & Woo, 1999). Without such a control and coordination mechanism, the

competitive strategy of each subsidiary will be formulated on a market-by-market basis.

What is optimal behavior at the subsidiary level however, might not be optimal for overall

MNE performance.

MNE Size

Consistent with previous research, MNE size in the present study refers to the

sheer organizational size such as the total assets or the total number of employees of an

MNE. Thus, in the context of this research "small" and "large" indicate absolute rather

than relative size. Although in certain conditions, some of my arguments may be more

relevant to relative size, they are nonetheless also applicable to absolute size. That is,

multinational firms that differ greatly in the absolute size of their whole corporations will

exhibit significantly different competitive behavior in the marketplace.

In the international business and strategic management literature, MNE size has

long been recognized as one important contingency factor in understanding MNE entry

mode choice (Yu & Ito, 1988), strategic alliance strategy (Gomes-Casseres, 1994),

internationalization process and organizational performance (Buckley & Casson, 1976;

Lu & Beamish, 2001). Large size has been seen as giving an MNE such advantages as

economies of scale, experience, brand name recognition and market power. Conversely,

smallness has been credited with increasing flexibility in production and price, and with

enhancing risk-seeking behavior (Chen & Hambrick, 1995).

MNE size can also exert significant influence on an MNE's competitive behavior.

For large MNEs, on the one hand, the abundant slack resources they have give them a

greater ability to attack competitors and withstand intensified competition. On the other

hand, behaviorally, largeness is likely to breed complacency and competitive inertia

(Hannan & Freeman, 1984; Miller & Chen, 1994). Managers of large MNEs may feel that

they are powerful enough to ignore their rivals (Cyert & March, 1963). Previous studies

have shown that largeness is associated with structural complexity and bureaucracy,

which often prevent a firm from responding to an attack quickly.

In contrast to large MNEs, small MNEs are motivated to constantly seek

opportunities in order to survive and prosper (Aldrich & Auster, 1986; Katz, 1970). They

have a greater need than their large rivals to act aggressively and to challenge the status

quo in the host market (Chen & Hambrick, 1995). Moreover, small MNEs may also have

some competitive devices that are typically not available to their large competitors. For

instance, they may poke their large rivals and test their reputations by frequently initiating

strategic skirmishes, or they can defend their "backyard" (home market) by spoiling their

large rivals' home markets (Casson, 1987).

National Culture

National culture—a socially shared knowledge structure—provides the members of a cultural group with schemas or templates, for interpreting both the situation and the behavior of others (Fiske & Taylor, 1984). As one important way to capture the differences in values and norms embedded in varying national cultures, understanding cultural distance is key to carrying out global research. Generally, research on cultural distance in the international business literature can be classified into three groups. The first group of scholars uses cultural distance to explain the location and sequence of MNEs' FDI (Davidson, 1980; Dunning, 1988; Forgsren, 1989; Johanson & Vahlne, 1977; Welch & Luostarinen, 1988). The second research stream focuses on the choice of entry mode into foreign markets where cultural distance has been found to be a very important predictor (Erramilli, 1991; Kogut & Singh, 1988; Larimo, 1993). Finally, in the third group of work, cultural distance has largely been taken to represent a hindrance to the performance of MNEs and their subsidiaries (Barkema, Shenkar, Vermeulen, & Bell, 1997; Chang, 1995; Park & Ungson, 1997).

Despite extensive research on cultural distance, limited effort has been made to examine the impact of national culture on interfirm rivalry. Actually, culture can come into play in several different ways in a global competition. First, rivals from different countries may demonstrate different competitive behaviors. For instance, Japanese culture is collectivist and hierarchical, while U.S. culture is individualistic and egalitarian (Hofstede, 1980; Schwartz, 1994). Both of these cultural values have important implications for competitive behavior. Doyle, Saunders and Wong (1992) found that, in

contrast to their western rivals, Japanese subsidiaries are more oriented to long-term

market share objectives and are more adept at tailoring their competitive strategies to local

market conditions. Due to the important impact of cultural value on MNEs' competitive

activity, culture similarity between rivals is likely to help them correctly interpret each

other's competitive intentions and therefore increase their motivation and capability to

interact with one another (Chen & Stucker, 1997).

Second, the cultural distance between an MNE's headquarters and its subsidiaries

will also affect the MNE's competitive capability against its rivals. When firms are

competing in the same country market or operating under similar circumstances, their

ability to receive and process information about competitors and the market environment

does not vary greatly, as information is readily available (Ghoshal & Kim, 1986).

However when firms are competing globally, factors that are non-influential domestically

may affect firms differently and therefore influence their competitive activities differently

(Robock & Simmonds, 1989). Kogut and Singh (1988) argued that because differences in

national cultures have been shown to result in different organizational and administrative

practices and employee expectations, it can be expected that the more culturally distant

two countries are, the more distant are their organizational characteristics on average, and

the more difficult it will be for an MNE to coordinate its competitive actions across these

two countries.

Government Regulations

The strategic management literature has long recognized the significance of

market characteristics and their competitive implications (Chen, 1996; Gimeno, 1999).

Especially in multimarket competition and competitive dynamics research, the differences between markets in terms of strategic importance, growth potential, competitor density and cost advantages have been widely used to explain the asymmetrical nature of competitive relationships between firms.

Despite the great promise that strategic management studies hold for conceptualizing multinational rivalry, the key elements of markets in an international context are dramatically different from those in a domestic setting (Chen & Stucker, 1997). For instance, entry barriers in a domestic market can be measured by structural variables such as number of competitors, market size and R&D investment required. However, in a global context, these variables are insufficient to capture the diverse market dynamics across countries. Instead, cultural, economic, political and socio-psychological idiosyncrasies associated with each national institutional environment are expected to be more crucial in explaining the competitive actions of MNEs.

The impact of institutional environment on a variety of MNE activities has been widely explored in the international business literature. Some researchers focus on the effect of legal and economic restrictions on an MNE's entry mode, location choice and internationalization process (Delios & Beamish, 1999; Gomes-Casseres, 1990; Loree & Guisinger, 1995; Rugman & Verbeke, 1998); while others examine the influence of cultural and language differences in addition to psychic distance on foreign MNEs' survival (Kostova & Zaheer, 1999; Zaheer & Mosakowski, 1997). Except for very few studies (MacDonagh-Dumler, 2001; Yu & Eden, 2001), most current research has ignored the impact of institutional environment on interfirm rivalry.

Despite the broad array of political, social and economic characteristics that an institutional environment may encompass, the present study however, concentrates on the role of government regulations in shaping MNE competitive activity. As noted by Chen and Stucker (1997), host government restrictions on FDI and interventions in MNEs' daily operation directly influence an MNE's motivation to enter certain markets. For example, in Japan, the *daiten-ho* (Small Scale Retail Law) has arguably hindered the entry of large-scale retailers such as Wal-Mart who benefit from significant scale economies (Akbar, 2000). Generally, the more receptive to foreign investment the host government policies are in a focal country market, the more frequently an MNE will enter and exit that market (Encarnation & Wells, 1986).

Second, as more and more companies go global, they increasingly use their government's regulations as a new type of competitive strategy—what Boddewyn (1986) called the "fourth generic" strategy. Here one research stream in the international business is noteworthy. In the early 1980s, a small group of scholars including Brander and Spencer (1981) and Krugman (1987) advanced a new theoretical approach called strategic trade theory. They argued that governments could raise national income at other countries' expense by sheltering national firms from international competition. Traditionally, the policy instrument suggested by strategic trade theory is either a tariff or a subsidy applied to home firms, which indirectly causes the foreign rival either to reduce output or increase price. With the assistance of a home government, unless the foreign government retaliates by offering similar protections, a " safe backyard" (home market) will greatly motivate the

domestic firm to compete more aggressively in other national markets (Yu & Eden, 2001).

Multimarket Contact

The research on multimarket competition highlights the importance of shared markets in shaping firm competitive behavior. As the degree of multimarket contact between two firms increases, their aggressiveness toward each other may be tempered by the possibility of cross-market retaliation. This tempering of aggressiveness is known as the mutual forbearance hypothesis (Edwards, 1955).

The multimarket competition literature has contributed substantial insights to understanding interfirm rivalry. However, as discussed earlier, this theoretical stream suffers from the following two limitations. First, the homogeneous domestic market focus prevents researchers from capturing the complexity of global competition. Almost no existing study in the multimarket competition arena has attempted to use this line of thinking to conceptualize multinational rivalry. Second and equally important, multimarket competition research has focused primarily on the overall aggregate effects of mutual forbearance. Very limited effort has been made to explore the dynamic process in which competitors actually enact their strategies, signal their aggressiveness, and defend their reputations (Baum & Korn, 1999; Chen & MacMillan, 1992).

In filling this gap, the present study refines prior research in three ways. First, it applies the logic and mechanisms of mutual forbearance to a global context. Due to the fast growth of internationalization in business, more and more firms are finding themselves competing against the same rivals in an increasing number of national and

regional markets. Multinational competition gives an MNE the option to respond to an attack by its rival not only in the challenged market, but also in other markets in which they both compete. Second, using the individual competitive move as the unit of analysis, the effect of mutual forbearance on interfirm rivalry is captured at the competitor dyad level. Finally, by testing the mutual forbearance hypothesis in a global context, the current study attempts to specify the situation under which multimarket contact may have a greater or weaker effect on reducing rivalry between MNEs.

SUMMARY

Drawing from literatures on strategic management and international business, I develop an integrated model in this chapter to describe how important organizational and environmental characteristics influence the competitive action of MNEs (see Figure 3.1).

Theoretically, the main contribution of this dissertation lies in the fact that it takes into account the key differences between domestic and multinational competition. As a result, the importance of a number of theoretical constructs that have been largely ignored by the existing literature is highlighted in the present study. Empirically, this dissertation contributes to the literature by advancing the current research of global competition from a collection of anecdotes to a multidisciplinary framework with rigorous data analysis and testing.

It should be noted that there are some other contextual factors that may also affect MNE competitive actions, such as market size, market growth rate, firm age and firm international experience. The effects of these factors will be controlled in hypothesis testing. In the following chapter, based on the integrated model of multinational rivalry, I

suggest nine hypotheses to predict the competitive aggressiveness of MNEs, which is conceptualized as two dimensions of competitive action: action volume and action complexity.

CHAPTER IV

HYPOTHESIS DEVELOPMENT

In this chapter, nine hypotheses are suggested to predict an MNE's competitive action along two dimensions—action volume and action complexity—in a global context. Figure 4.1 integrates all the theoretical constructs I have discussed in Chapter III into an elaborated research model of multinational rivalry. In contrast to the model presented in Figure 3.1, this elaborated framework refines each element included in the previous model and considers the important interaction effect between different elements on multinational rivalry. In the following section, the theoretical reasoning for each of the nine hypotheses illustrated in Figure 4.1 is provided in turn.

SUBSIDIARY CONTROL

As noted by Gimeno and Woo (1999), appropriate coordination and control mechanisms among different organizational units are critical for the effectiveness of competitive strategy at the corporate level. Especially for MNE subsidiaries operating in diverse national markets, such coordination and control become even more critical. Because of its strong domestic focus, most competition research implicitly assumes that there is sufficient coordination across multinational subsidiaries in different countries. Consequently, MNE differences with respect to their capability to implement corporate competitive strategy have been largely ignored.

Viewing the MNE as a network of capital, product and knowledge exchanges among subsidiaries (Ghoshal & Bartlett, 1990), the present study uses subsidiary control

to measure the extent to which an MNE subsidiary's decisions and actions can be shaped

by its headquarters. Compared with domestic firms, one fundamental competitive

advantage that a multinational firm can have is to integrate its competitive position across

national markets. Ghoshal (1987:425) argued that, to an MNE, "its competitive position in

one national market is affected by its competitive position in other national markets". This

linking of competitive positions across countries implies that the international activities of

MNE subsidiaries must be coordinated in a manner that develops and sustains advantage

in response to the cross-national competitive forces (Prahalad & Doz, 1987).

Considering the arguable impact of subsidiary control on the driving forces of

interfirm rivalry, in the first hypothesis, I predict that the strong control that an MNE's

headquarters has over its subsidiary in a given country market increases this MNE's action

volume and action complexity as it competes against other rivals in the same country

market. In fact, conflicting views exist in the international business literature regarding the

effect of headquarters control on a subsidiary's international activity. Some scholars argue

that a high level of international integration restricts subsidiary autonomy (Baliga &

Jaeger, 1984; Gates & Egelhoff, 1986). The present study however takes a very different

tack. It emphasizes that managing headquarters-subsidiary relationships involves

balancing forces that call for international integrations of operation against forces that call

for national responsiveness (Doz & Prahalad, 1984). In a global competition, it is

important for MNE subsidiaries to consider the global market as an integrated chessboard

and to react to competitor's challenges in light of the whole MNE rather than just regional

or local market gains (Chen & Stucker, 1997; Yip, 1995). Building on this fundamental

assumption, the positive relationship between subsidiary control and an MNE's action volume and complexity can be understood from the following aspects.

First, sufficient subsidiary control facilitates knowledge transfer and information flow within an MNE. Due to cultural diversity and geographic distance, information imperfections are likely to be much more salient in a global context (Porter, 1980). As a way to reduce the uncertainty, an efficient information exchange mechanism enforced by strong subsidiary control can help an MNE subsidiary better interpret the implications of its competitor' s movements and improve its motivation and capability to undertake more competitive actions. Furthermore, an efficient information exchange mechanism within an MNE can also provide subsidiary managers with knowledge about many different forms of rivalry and thus gives rise to less simple competitive repertoires.

Second, Anderson and Gatignon (1986) argued that the strong control achieved by administrative mechanisms provides an MNE headquarters with the ability to influence systems, methods and decisions of its subsidiaries and with a means to resolve disputes that could arise in the joint management of an enterprise. Consequently, strong subsidiary control contributes to the development of shared values and norms among subsidiary managers and therefore increases their willingness to transfer assets and share competitive experiences with other subsidiaries that are threatened by competitors.

In sum, an MNE's action volume and action complexity in a given country market will be enhanced when it can draw information and resources from a highly integrated within-MNE network enabled by sufficient subsidiary control mechanisms.

Hypothesis 1a: The degree of subsidiary control that an MNE headquarters has over its subsidiary in a given country market is positively related to its action volume in that country market.

Hypothesis 1b: The degree of subsidiary control that an MNE headquarters has over its subsidiary in a given country market is positively related to its action complexity in that country market.

MNE SIZE

Organizational size has interested many scholars of competition. For instance, Chen and Hambrick (1995) empirically examined how small firms differ in competitive behaviors from their large rivals. Smith, Grimm and Gannon (1992) explored the relationship between the reputation of an attacker as a market leader and the tendency of a rival to imitate its action.

Drawing from various literatures, in the second hypothesis, I suggest that the absolute size of an MNE is positively related to its action volume and negatively related to its action complexity in a given country market. In line with previous research, the positive impact of MNE size on its action volume can be understood from the following two aspects. First, large MNEs have more slack resources than their smaller rivals do. Organizational slack gives a firm leeway in managing responses to competitive pressures and allows it to execute a greater number of competitive moves (Ferrier, 2001; Young et al., 1996). By contrast, the relatively low level of slack resources in small MNEs inhibits their ability to mobilize necessary resources and constrains strategic change and aggressiveness (Fombrun & Ginsberg, 1990; Pettigrew, 1992). Second, to prevent their reputations from being damaged, large MNEs are propelled to constantly defend their market leadership in face of rivals' challenges (Fombrun & Shanley, 1990; Weigelt &

Camerer, 1988). The larger the firm, the greater the reputation, and the greater the pressure to take actions when being threatened (Chen & Hambrick, 1995; Clark & Montgomery, 1998).

Regarding the negative effect of MNE size on its action complexity, as noted by Miller and Chen (1996), size may well breed simplicity. Managers of large MNEs may feel that they are powerful enough to ignore their weak rivals (Pfeffer & Salancik, 1978). This will prevent them from broadening their cognitive models and strategies in response to environmental changes. The vulnerability of small MNEs, by contrast, may force managers to be alert to both opportunities and threats in the marketplace, and these challenges will also dissuade managers from becoming too narrow-minded or obsessive. Furthermore, large size is also associated with rules and standard operating procedures designed to achieve reliability and economies of scale, which may greatly constrain managers from experimenting with different competitive tactics.

In sum, I hypothesize:

Hypothesis 2a: The absolute size of an MNE is positively related to its action volume in a given country market.

Hypothesis 2b: The absolute size of an MNE is negatively related to its action complexity in a given country market.

NATIONAL CULTURE

Does the nationality of an MNE affect its strategy in different national markets? This question has consistently intrigued researchers in the international business and strategic management literatures. Previous research in competitive dynamics and multimarket competition usually assumes a homogenous cultural environment and fails to

capture the complexity of a global context. Responding to this gap, in the following two hypotheses, cultural distance is used as an important factor to predict MNEs' competitive actions. Grounded in three underlying drivers of interfirm rivalry: awareness, motivation and capabilities (Chen, 1996), in Hypothesis 3, I explore the impact of cultural distance between a focal firm and its rival on the focal firm's action volume and action complexity. In Hypothesis 4, I examine how cultural distance between a focal firm's home country market and host country market in which it competes influences its competitive action in the host country market.

Cultural Distance between Rivals

From a game theoretic perspective, incomplete information always hampers managers, who must make competitive decisions based on their estimates of rivals' payoffs. Therefore, managers should welcome any vehicle that can reduce the variance of their estimation caused by uncertainty. In the competitive dynamics literature, a number of factors playing such a role in domestic competition are suggested. For instance, Chen (1996) argued that each firm has a unique market profile and resource endowment and that a comparison with a given competitor along these two dimensions will help two firms illustrate the competitive relationship between them and predict how they may attack or respond to each other in the market. Consequently, a focal firm will compete more fiercely against a rival with similar resources and common market profiles. Building on the insights of previous research, in Hypothesis 3, I suggest that, as a key variable to carry out global research, cultural distance is critical in understanding the asymmetric competitive

relationships between multinational firms. More specifically, an MNE will compete more aggressively against a rival with similar cultural background across national markets.

First, when competing across borders, culturally distant rivals are often operating under very different administrative practices and playing by different "rules" of competition, which will lead to high unpredictability of their behaviors. By contrast, two competitors of similar cultural background will find it relatively easy to understand each other's competitive movements and strategic intentions and therefore increase their desire to engage with one another.

Furthermore, firms involved in global competition begin their lives under very different legal, social and political environments and histories, all of which shape the organizational norms, structures and practices (McKendrick, 2001). Culture, as a socially shared knowledge structure, provides the members of a cultural group with similar schemas, or templates for interpreting situations and behaviors of others (Fiske & Taylor, 1984). Therefore, firms from similar cultures are likely to have similar strategic capabilities as well as competitive vulnerabilities in the marketplace. For instance, compared with their Western competitors, most Asian MNEs are strongly supported by their governments and have very close relationships with their domestic suppliers and distributors. As suggested by competitive dynamics research, when being challenged, if a competitive response requires major organizational restructuring, firms will be less likely to respond or will respond more slowly (Chen, 1996). Conversely, firms that have similar competencies to the attacker will have the greatest potential and capability to retaliate.

Finally, firms from similar cultures are likely to be perceived similarly by foreign customers. And in most cases, their major customer groups are the same as well. The close cultural identify is likely to force two multinational firms to compete more fiercely for the "mindshare" of their customers. For instance, sales in Asia account for an important proportion of global profits for both Toyota and Hyundai and the two firms sell similar vehicles to similar groups of customers. Consequently, relative to other European competitors, an action initiated by Toyota will give Hyundai more motivation to react.

Therefore, I predict that the cultural distance between a focal firm and its rival decreases its action volume in a given market[3]. Regarding the effect of cultural distance on action complexity, I suggest that, due to the fact that firms from similar cultures are likely to have similar strategic capabilities, when competing against culturally similar rivals, managers need to hedge their bets with a diverse set of competitive methods and employ more comprehensive business strategies. By contrast, managers will be less driven to supplement their favorite competitive tactics as competing against culturally distant rivals because of the high uncertainty involved in estimating their rivals' payoffs.

> *Hypothesis 3a: The cultural distance between an MNE and its rival in a given country market is negatively related to its action volume in that country market.*

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[3] It should be noted that, building on previous literature, conflicting arguments may exist regarding the effect of cultural similarity between rivals on competitive aggressiveness. For instance, according to multimarket competition theory, compared with culturally distant rivals, two firms of similar cultural background are likely to encounter each other more frequently in multiple geographic markets. Consequently, the competitive intensity between them will be reduced because of the possibility of cross-market retaliation. By contrast, the present study highlights the importance of cultural similarity in helping rivals interpret each other's strategic intensions and motivating them to compete more aggressively due to the competitive pressure caused by similar cultural identity.

Hypothesis 3b: The cultural distance between an MNE and its rival in a given country market is negatively related to its action complexity in that country market.

Cultural Distance between Home and Host Markets

Focusing on cultural value embedded in different national markets, in Hypothesis 4, I propose that cultural distance between the home market of a multinational firm and the host market in which its subsidiary operates decreases its action volume and action complexity in the host market.

For a multinational firm, the cultural diversity of the markets in which it competes has a decisive effect on its mode of globalization and internal organization, which in turn affects its cross border competitive capability (Barkema, Bell, & Pennings, 1996; Gupta & Govindarajan, 2001; Kogut & Singh, 1988). As argued by Kostova and Zaheer (1999), when firms set up operations abroad, they face certain unavoidable costs that they will not have when operating domestically. These costs of doing business in a foreign country, which they called "liability of foreignness", could arise from varying sources, such as the high internal coordination costs, the foreign firms' unfamiliarity with the local culture and other aspects of the local market or a lack of information networks or political influences in the host country. The liability of foreignness is likely to be more severe when an MNE operates in a culturally distant country. As strangers in strange land, the social-psychological impediments caused by cultural distance will make the multinational firm very difficult to survive or undertake aggressive competitive moves.

Furthermore, general management expertise and technical know-how are more difficult to exploit when differences in cultural contexts make activity sharing and synergy

formation between an MNE headquarters and its subsidiary less efficient (Bartlett & Ghoshal, 1992). Studying 1,226 intra-firm technology transfers carried out by 32 American multinationals, Davidson and Mcfetridge (1985) found that American firms were more likely to transfer technology between the home and a foreign subsidiary when the receiving country is culturally related.

In addition, attempts for an MNE to successfully operate multiple subsidiaries in diverse cultural contexts may be frustrated by conflict and frictions between the headquarters and subsidiaries, lack of cohesion and misunderstanding among key decision makers and communication breakdowns between boundary spanners. Therefore, Gomez-Mejia and Palich (1997) noted that expanding into culturally similar countries should lead to greater homogeneity of perceptions and clearer communication between the headquarters and foreign subsidiaries than expanding into culturally distant countries.

Finally, the greater the extent to which MNE headquarters and subsidiaries differ in their cultural characteristics, the more difficult it becomes to effectively supervise the operation of subsidiaries. Since the local interests of subsidiaries may not always be aligned with those of the MNE as a whole, as cultural distance increases, the subsidiaries face greater liability of foreignness and more pressure to be nationally responsive. As a result, the challenges for the internal control system increase proportionately. Complete and accurate information about subsidiaries becomes difficult and expensive to obtain, which may significantly hinder the execution of corporate level competitive strategy.

Taken together, I hypothesize that the cultural distance between an MNE's headquarters and its foreign operations decreases its action volume in the foreign country

market. Moreover, I argue that a larger cultural difference between headquarters and a foreign operation also presents challenges and difficulties for an MNE to overcome with respect to information imperfection and internalization of management practice. As a result, most of the managerial time and resources will be spent overcoming the liability of foreignness and building internal information exchange mechanisms, and managers will feel less driven to search for alternative ways of competing or to supplement their favorite competitive activities (Walsh, 1995).

> *Hypothesis 4a: The cultural distance between the home country market of an MNE and the host country market in which its subsidiary competes is negatively related to its action volume in the host country market.*

> *Hypothesis 4b: The cultural distance between the home country market of an MNE and the host country market in which its subsidiary competes is negatively related to its action complexity in the host country market.*

GOVERNMENT REGULATIONS

When firms compete with each other across countries, market conditions are substantially different from those in a domestic setting. Perhaps the most critical determinants of market conditions are the constraints imposed by varying government regulations. Despite its importance to MNE competitive activity, the linkage between government regulations and multinational rivalry has been largely ignored in the international business and strategic management literature.

National governments can impose a variety of constraints to affect the strategic options of multinational firms. These constraints may take the form of economic, legal, political or socio-psychological impediments. The present study however will only focus on government economic and political policy and its impact on MNE competitive

behavior. Assuming that there is Firm A from Country A competing with its multinational rivals in Country C, in Hypothesis 5, I examine the impact of government constraint in Country C on the competitive action of Firm A in Country C. In Hypothesis 7, I investigate the impact of government protection in Country A on the competitive action of firm A in Country C.

The Effect of Host Government Constraint

In Hypothesis 5, I propose that strong host government regulation against foreign MNEs will significantly reduce the action volume and action complexity of foreign MNEs in the host country market.

First, political risk in the host environment can have a decisive effect on an MNE's competitive activity. Researchers have found that under conditions of high political risk, multinationals pursue low-commitment strategies such as exporting (Agarwal & Ramaswami, 1992) and joint ventures (Henisz & Delios, 2001). Consistent with previous literature, the political risk in the present study is defined as the probability of expropriation of assets or adverse changes in taxes, regulations or other agreements that force alternations in MNE operations or strategies (Henisz & Delios, 2001). High political risk may significantly restrict an MNE's capability and motivation to engage in competitive activity in a foreign country market. For example, in 1995, when Brazil's government suddenly doubled the import tax on built-up vehicles from 32 percent to 70 percent, the tax hike generated huge losses for the country's four principle carmakers—Volkswagen, Fiat, General Motors and Ford—who had planned to begin importing thousands of vehicles a year to round out local lineups.

Second, by defining how markets should operate, host governments can use various economic regulations to put foreign MNEs in a very disadvantageous competitive position. For instance, for years, in China, foreign carmakers have had to get government approval not only for each new automotive venture, but for each new body style or model design. Majority foreign ownership of automotive ventures is completely forbidden. A similar scenario can also be found in South Korea. Due to high import barriers, in 1999, there were only 2,400 imported vehicles sold in Korea according to the Automotive Trade Policy Council. By imposing various constraints such as tariff and non-tariff barriers on foreign MNEs' operations, host governments can force foreign firms either to reduce output or increase price. Moreover, using regulations such as local content requirements and rules of origin, host governments can also break apart foreign MNEs' well established relationships with their suppliers and distributors and destabilize their efficient production process.

In sum, I suggest that strong government constraint in the host country market may directly reduce a foreign MNE's willingness and capability to undertake aggressive competitive actions. As a result, the managers' opportunities to try out a wide variety of strategic options and tactics will also be greatly restrained.

Hypothesis 5a: The level of host government constraint is negatively related to an MNE's action volume in the host country market.

Hypothesis 5b: The level of host government constraint is negatively related to an MNE's action complexity in the host country market.

Often host government constraints affect all foreign MNEs equally—but not always. Based on Hypothesis 5, one should expect a greater number of competitive

actions from those MNEs that are less susceptible to host government constraints. Consider the following example as an illustration. In 1996 because of a deal between South Korea and Indonesia, Indonesia's government granted Kia the right to import 45,000 Sephias without paying any import duties or luxury taxes. Rival automakers protested. Ford even left Indonesia, saying it could no longer compete.

The Moderating Effect of Country of Origin

In Hypothesis 4, I suggest a negative relationship between host government constraints and the competitive aggressiveness of foreign MNEs. In the next hypothesis, I further suggest that this competition-reduction effect will be much stronger when the focal firm competes against a rival with a similar cultural background.

Economic and political barriers imposed by a host government will put foreign multinationals in a very disadvantageous position relative to their local rivals. To maintain their market share and increase their bargaining power over the host government, foreign multinationals are motivated to look for partners in the local market. In contrast to firms from culturally distant countries, I argue that firms with similar cultural background are more likely to develop cooperative relationships for the following two reasons. First, managers from similar cultures are likely to share similar values and beliefs and therefore are more capable of correctly interpreting each other's signals and intentions. Second, firms from similar cultures are also likely to have common suppliers, distributors and customers (Porter, 1976; 1979). Repeated contact through these intermediaries increases the flow of information upon which interorganizational coordination is more easily developed (Stigler, 1968).

At first glance, competition and cooperation appear to occupy opposite ends of the spectrum of interorganizational relationships. A small group of researchers however, has begun to challenge this traditional view of the competition/cooperation relationship. Some of them suggest that the combination of competitive and cooperative strategies can create higher profits, which they call syncretic rents (Afuah, 2000; Bengtsson & Kock, 2000; Brandenburger & Nalebuff, 1996). Others have depicted the coexistence of competitive and cooperative interactions in a group-versus-group competition (Gomes-Casseres, 1996; Nohria & Garcia-Pont, 1991). Group-versus-group competition emerges when rival firms use alliances to create constellations (Das & Teng, 2001) or strategic blocks to compete with other constellations or blocks. Gomes-Casseres (1996) insightfully pointed out that such a pattern of group level competition is especially significant in a global setting.

Based on the idea of group competition, I suggest that in a highly regulated host environment, to improve their competitive positions, foreign MNEs from similar cultures are likely to cooperate to a certain degree and strategically lower the competitive intensity against each other. Consider the competition between automakers in India as an example. In order to compete with the Maruti800, the market leading car model made by a joint venture between the Indian government and Suzuki Motor Co., Fiat and Peugeot have cooperated closely for years in a minivan and truck venture in India.

 In sum, I hypothesize that,

Hypothesis 6a: The level of host government constraint is more negatively related to an MNE's action volume in the host country market when it competes with a culturally similar rival.

Hypothesis 6b: The level of host government constraint is more negatively related to an MNE's action complexity in the host country market when it competes with a culturally similar rival.

The Effect of Home Government Protection

Porter (1980) developed a paradigm of three generic strategies for firms struggling for competitive advantage: cost competition, product differentiation and focus. Beyond these three generic strategies, when firms compete internationally, they tend to increasingly use policy measures of their home governments as a new type of competitive strategy. This is what Boddewyn (1986) called the "fourth generic strategy".

Different from Hypothesis 5, which emphasizes the competition-reduction effect of host government constraints on foreign multinationals' competitive actions, in Hypothesis 7, I predict that multinationals will be more prone to undertake aggressive competitive movements in foreign countries when their home country market is well protected by their government.

First, according to strategic trade theory, scholars such as Brander and Spencer (1981) and Krugman (1987) argue that a government's protection can offer its home firm an opportunity to shape the competitive environment in such a way as to improve its position against foreign rivals. For years, strategic trade theory has been criticized for not considering foreign government retaliation. However, in the real world, we frequently observe that governments adopt trade policies even under the threat of other governments' retaliation. Brander (1986:39) provided an explanation for this "irrational" behavior. He argued that "a policy action is normally the product of many different sectors". Although a government regulation may not be beneficial in a rigorous economic sense (national

welfare enhancement), it can be used for other strategic purposes. In particular it has important competitive implications for domestic firms' global expansion. In certain countries, new industries take a while to get established because of startup problems or because a particular country or region is somehow initially disadvantaged. By insulating home industry from competition, a government can help its domestic firms to slide down the learning curve and gradually gain market presence in other foreign markets (Hart & Prakash, 1997; Stegemann, 1989).

American trade theorists always use Japan as a classic example of using government protection to support Japanese firms' aggressive international expansion. From less than one percent of world production in 1955, Japan had grown to be the world leader in the machine tool industry by 1982. The Ministry of International Trade and Industry (MITI) used a variety of tariffs to protect the domestic machine tool industry from challenge by foreign imports. As a result, government protections provided a "safe backyard" for the Japanese firms. When they matured, they began to aggressively enter foreign markets and successfully drove many U.S. competitors out of business (Collis, 1988: 86).

Second, as suggested by competition research in the strategic management literature (Chen, 1996; Gimeno, 1999), asymmetric territorial interests can significantly affect the competitive intensity between two firms. Thus, it is likely that a firm can strategically use its collusion in a rival's key market in exchange for this rival's collusion in the firm's important market. This is called the "sphere of influence" effect (Edwards, 1964). The present study assumes that the home country market is the key market that

each MNE wants to protect (hub). Building on the "sphere of influence" argument, normally one would expect that as two multinationals compete with each other globally, in order to keep their homes safe, the implicit threat of reciprocal retaliation will cause them to mutually forbear from undertaking aggressive movements in each other's domestic market. However, this conclusion is weakened by including government in the analysis. When a focal firm is able to use government protection to curtail its rival's access to its home country market, with its "backyard" well protected from foreign penetration, the focal firm is likely to be more prone to make aggressive competitive moves in foreign countries. Moreover, without fear of retaliation at home, a safe backyard will also enable managers to try different tactics in an effort to attract customers or to fend off aggressive rivals.

Taken together, I hypothesize that,

Hypothesis 7a: The level of government protection in the home country market is positively related to an MNE's action volume in the host country market.

Hypothesis 7b: The level of government protection in the home country market is positively related to an MNE's action complexity in the host country market.

MULTIMARKET CONTACT

Theories of multimarket competition agree that firms with high overlap in their business domains frequently encounter each other simultaneously in multiple product or geographic markets. As the degree of multimarket contact between two firms increases, their aggressiveness toward each other is tempered by the possibility of multimarket retaliation (Edwards, 1955).

The multimarket competition literature has provided great insights to our understanding of interfirm rivalry. More importantly, the logic and mechanisms of mutual forbearance are likely to be applicable to an international arena. Multinational competition gives a firm the option to respond to an attack by a rival not only in the challenged market, but also in other markets in which they both compete (Gimeno, 1999). As an example, consider the contest between Goodyear and Michelin (Hamel & Prahalad, 1985). In the early 1970s, Michelin used its strong European base to attack Goodyear's home market (the US). Since Michelin only had a small amount of its worldwide sales in the United States, it had little to lose. However, Goodyear ultimately struck back in Europe, aggressively threatening Michelin's prime market. By playing tough through retaliation, Goodyear slowed the pace of Michelin's retaliation and forced it to recalculate the cost of market share gains in the United States.

Directly applying the mutual forbearance hypothesis to global competition, I suggest that, as the number of multimarket contacts between a focal firm and its rival increases, the motivation for the focal firm to engage in aggressive competitive actions will be significantly reduced. Consequently, managers of the focal firm are more likely to concentrate their resources and attention on the competitive tactics they are familiar with and willing to use.

> *Hypothesis 8a: The level of multimarket contact between an MNE and its rival is negatively related to the MNE's action volume against this rival.*

> *Hypothesis 8b: The level of multimarket contact between an MNE and its rival is negatively related to the MNE's action complexity against this rival.*

The Moderating Effect of Country of Origin

In the multimarket competition literature, "the market" is primarily a simplification of a domestic geographic market. The implicit assumption of market homogeneity and cultural commonality, which has been reinforced by studies focusing on highly homogeneous domestic industries, has greatly restricted the explanatory power of this research stream for conceptualizing multinational rivalry. Thus, it is important for scholars conducting competitor analysis on MNEs to consider factors that can capture the differences between domestic and global competition. As one of these factors, in the following hypothesis, country of origin is proposed to have a moderating effect on the relationship between multimarket contact and firm competitive action.

I suggest that the competition-reduction effect of multimarket contact will be weaker when two multinational firms are from culturally similar countries. First, multinational firms with similar cultural backgrounds are likely to be perceived similarly by others and also likely to target similar customer groups. As a result, one would expect more competitive actions between culturally close rivals than between culturally distant rivals due to the pressures and threats they feel about each other's attack. Second, as discussed earlier, firms from similar cultures are likely to have similar capabilities and competencies. Hence, a focal firm will be the most capable one in the market to react to an attack issued by a rival from a similar culture. Finally, firms from similar cultures can easily understand each other's strategic intentions. Therefore, they are more likely to undertake aggressive competitive actions against one another.

Thus, I hypothesize:

Hypothesis 9a: The level of multimarket contact between an MNE and its rival is less negatively related to the MNE's action volume when the rival is from a culturally similar country.

Hypothesis 9b: The level of multimarket contact between an MNE and its rival is less negatively related to the MNE's action complexity when the rival is from a culturally similar country.

SUMMARY

In this chapter, combining insights from previous literature, I investigate how important organizational and environmental characteristics influence the competitive actions of MNEs. Accordingly, nine hypotheses are offered to predict the competitive actions of MNEs along two dimensions—action volume and action complexity—using factors such as subsidiary control, MNE size, cultural distance between rivals as well as between home and host markets, host government constraint, home government protection and multimarket contact. In contrast to prior competition study, the framework proposed in this dissertation takes into account the key differences between domestic and global competition with the intention of improving our understanding of multinational rivalry.

In the next chapter, I will move to the methodology section and explain how I identified sample firms, measured variables, collected the data, designed the study and conducted the statistical analysis.

CHAPTER V

RESEARCH METHODOLOGY

This chapter describes the methodology used in this study. The chapter is organized into the following sections: 1) sample selection; 2) overall research procedure—data sources, data organization, identification of competitive actions; 3) measurement of major variables; 4) overview of the statistical analysis.

SAMPLE SELECTION

Regarding the empirical setting for hypothesis testing, I have considered a number of alternative industries such as the banking industry and the energy trading industry. The global automobile industry was finally selected because of the following characteristics it possesses. First, the industry is well known for its intense competitive interactions among major industrial participants (Martin, Mitchell, & Swaminathan, 1995; Thomas & Weigelt, 2000). Given the focus of this research on individual competitive action, it becomes desirable to limit the study to a highly competitive environment in which competitive events are more likely to be observed and firms need to be responsive to competitive actions taken by their rivals.

Second, this industry has an identifiable and manageable set of major industrial competitors that are strategically linked. As a global industry, the international automobile market reflects the increasing importance of global sales and production by firms from the industrial triad of nations (Japan, North America and Western Europe) (Tallman, 1991). Consequently, a high degree of interdependence exists among these major players –which

is what industrial organization economists call an oligopolistic market structure. In an oligopolistic industry, strategic actions undertaken by one firm should have significant impacts on other competitors, and the outcome of an action is also highly dependent on the responses made by rival firms.

Third, the industry has rich information sources regarding competitive moves among firms. As a large contributor to many national economies, information about the automobile industry can easily be found from various publications such as business journals, industry newsletters, and regional, national and international newspapers. More importantly, most of these resources are available on line. Thus, it is possible to rely solely on published information to identify competitive events, to trace the process of competitive interactions and to measure various characteristics of competitive actions and responses (Chen, 1988).

Finally, the industry has a clearly defined boundary in that for most of the competitors, this industry represents their major line of business at the corporate level. That is, most firms are "single businesses" or "dominant businesses" (Rumelt, 1974) so the potential for confounding influences of corporate-business relationships on industrial competition is minimized (Chen, 1988).

After choosing the global automobile industry as the empirical setting to study, data about 13 major car manufacturers based on *Ward's Automotive Yearbook* were collected. Table 5.1 provides a list of the 13 sample firms. These companies represent all significant global automakers. Overall they account for 88% of world motor vehicle production in 2000. Hence, most of the industry's economic activity is captured in the

research sample of this study. I excluded companies operating only in local or protected markets (generally third world countries or countries of the former communist bloc) since these companies neither significantly influence nor are influenced by global competition. Also excluded were a number of very small "craft based" sports cars manufacturers (e.g. Aston Martin, Ferrari, Lotus). Most of these companies produce less than 100 cars per year and have very specialized clientele.

OVERALL RESEARCH PROCEDURE

Data Source

The approach I used to collect data is similar to that used by Smith, Grimm and Gannon (1992); Chen (Chen, 1988; 1996); Young, Smith and Grimm (1996) and Ferrier, Smith and Grimm (1999), which has been called "structured content analysis" (Jauch, Osborn, & Martin, 1980).

Competitive actions of sample firms over the period Jan. 1995 to Dec. 2001 were identified from the *Automotive News* included in *Business and Industry* online database. After surveying various publications, from general business publications—*Wall Street Journal, Business Week, Fortune*—to industry specific publications—*AutoWeek, Automotive Industries, Automotive Marketing, Automobile Production*—it was concluded that *Automotive News* has the most complete and detailed information for the purpose of the present study. Established in 1925, *Automotive News* was purchased by Crain Communications, Inc. in 1971. Regarded as the "Bible" of the automotive industry, *Automotive News* covers the manufacturing side of the automotive industry, including engineering, design, production and suppliers, with equal emphasis on the retail side of the

industry, including the marketing, sales, service and resale of vehicles. Delivered weekly to more than 80,000 subscribers in 70 countries, *Automotive News* has become the leading source of news for the auto industry all over the world.

To further investigate the overall accuracy, comprehensiveness and managerial usage of *Automotive News* as a source of information about competition in the global automobile industry, a random subsample of 20 competitive moves was drawn, of which 17 (85%) were found and confirmed in their details by other major business publications and newspapers. This result is reasonable because *Automotive News* is more exhaustive in its reporting of automaker competitive actions as it is a more specialized industry periodical.

Data on government regulations in different countries were largely collected from *The Global Competitiveness Report*[4] published by World Economic Forum. *The Global Competitiveness Report* combines two basic kinds of data. Quantitative data are indicators of a country's economic performance, technological capacity and infrastructure taken from a wide variety of published sources. The survey data come from the Executive Opinion Survey conducted each year by the World Economic Forum. The survey measures the perceptions of leading business executives about the competitiveness of the country in which they operate. The survey obtains responses from about 4,000 executives in the 59 countries. According to their relevance to international competitiveness, both quantitative and survey data are classified and distributed to eight factors such as

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[4] For certain years, when the data is not available in *The Global Competitiveness Report*, I used the *World Competitiveness Yearbook* published by IMD as a supplement.

openness, government, finance, infrastructure, technology, management, labor and institutions.

In addition to data on competitive action and government regulations, data about MNE ownership structure and market share in different countries were collected from *Who owns whom—the directory of corporate affiliations* (Volume V for International Public and Private companies and Volume III for US public companies), sample firms' yearly financial statements and *Ward's Automotive Yearbook.*

Data Organization

To test the hypotheses proposed in Chapter V, three panel datasets were employed to examine the competitive actions of multinational firms. It should be noted that these three datasets draw from the same sample firms, and they differ only in the level of analysis. Additionally, lower level of analysis dataset (which is Dataset 2 in the present study) is aggregated to create higher level of analysis datasets (Dataset 1 & 3). In the following section, I introduce each of these datasets in turn and a summary can also be found in Appendix B.

Dataset 1. This dataset includes one observation per firm (the firm who initiated a competitive action), per country market per year. It tests hypotheses regarding the impact of subsidiary control, MNE size, cultural distance between home and host markets, host government constraint and home government protection on multinational rivalry (Hypotheses 1, 2, 4, 5 and 7). In dataset 1, the cross-sectional unit is defined by firm-country market pair. All independent variables were updated each year, except time-invariant variables such as subsidiary control and cultural distance. The first

dependent variable—action volume—was measured by the total number of competitive moves a focal firm takes against all its rivals in a given country market and a given year. The second dependent variable—action complexity—was measured by the total types of competitive actions that a focal firm takes against all its rivals in a given country market and a given year. As indicated before, the present study classified competitive action into nine categories: capacity action, changes in organizational structure and management systems, improvement of distribution and after-sales service, marketing action, pricing action, new product action, technology innovation, international expansion and diversification.

Dataset 2. As the fundamental dataset of this research, Dataset 2 includes one observation per focal firm-competitor dyad, per country market per year. It is primarily created to test hypotheses regarding the impact of cultural distance between rivals on multinational rivalry (Hypothesis 3) and the moderating effect of country of origin on the relationship between host government constraint and MNEs' competitive actions (Hypothesis 5). In dataset 2, the cross-sectional unit is defined by focal firm-competitor-country market. The dependent variable—action volume—was measured by the total number of competitive moves that a focal firm takes against one particular rival in a given country market and a given year. Accordingly, the dependent variable—action complexity—was measured by the total types of competitive actions that a focal firm takes against one particular rival in a given country market and a given year.

Dataset 3. This dataset includes one observation per focal firm-competitor dyad per year. It tests hypotheses regarding the impact of multimarket contact on multinational

rivalry (Hypotheses 8 and 9). In Dataset 3, the cross-sectional unit is defined by focal firm-competitor dyad. Consequently, the dependent variable—action volume—was measured by the total number of competitive moves that a focal firm takes against one particular rival across all countries in a given year. The second dependent variable—action complexity—was measured by the total types of competitive actions that a focal firm takes against one particular rival across all countries in a given year.

Identification of Competitive Actions

Consistent with previous research in competitive dynamics (Chen, 1988; Ferrier et al., 1999; Smith et al., 1992; Young et al., 1996), an action is defined as "a specific and detectable competitive move, such as a price cut or new product introduction, initiated by an MNE to defend or improve its relative competitive position in a given country market". I consider a competitive action significant and important if it targeted at least one competitor and was reported in *Automotive News.*

The present study employed a rigorous procedure to identify the competitive actions of sample firms in different countries. First, I developed a list of key words to search competitive actions reported in *Automotive News*. It should be noted that most of the key words previous researchers have used to conduct content analysis of interfirm rivalry were specifically chosen for the airline industry (over 80% of the research in competitive dynamics published in top management journals used the airline industry as the empirical setting). In order to select the words/phrases that suggest competitive actions among auto industry firms, I read all the articles published by *Automotive News* in 1995 and was able to identify 211 competitive actions, from which I generated a list of key

words for the analysis of the full study (a full list of key words appears in Appendix C).

Consider the following two competitive actions as an illustration. "The 2000 Altima

(Nissan) sedan will have a new fascia to *battle* the Honda Accord and Toyota Camry"

(*Automotive News*, June 14, 1999). "The Buick Rendezvous will have the ride and

handling of a luxury car with the versatility of a sport-utility. It's a *response* to the Lexus

RX 300" (*Automotive News*, August 16,1999). Basically, these two competitive events

were selected because of the appearance of key words—*battle* and *response*—in the text

of two news articles.

Second, after generating the key word list, I identified all the news reports related

to sample firms (72 competitive dyads) that included the key words/phrases I was

interested in. This yielded 6,648 news articles. After an extensive and careful read of all

these 6,648 articles, 5,188 competitive actions were identified using a pre-designed,

structured coding schedule. The raw data were then carefully screened for duplicates.

Only the earliest chronological appearance of a particular competitive action was retained.

Consistent with previous research, I coded these competitive actions into nine

action types: pricing action, new product action, marketing action, technology innovation,

capacity action, improvement in distribution and after sales service, diversification,

international expansion and changes in organizational structure and management systems.

Appendix D contains the descriptions and examples of each of these action categories. To

check the reliability of my coding, I asked one academic expert in strategic management

to separately recode a random subsample of 30 competitive actions into each of the nine

action categories. We were in agreement for 28 of the 30 competitive moves.

Automotive News specifies the major geographic markets in which the reported action occurred. I replicated my coding of competitive action when more than one geographic market was specified. For instance, if one competitive action undertaken by GM against Toyota was reported to have influence in both Germany and the US, I coded it as two competitive moves between GM and Toyota (one in Germany, the other in US). Finally, I deleted countries in which less than 2 competitive moves were coded.

Additionally, I entered 0s when no competitive actions occurred between rivals in a given country market and a given year. During the time period studied in this research, most of the sample firms have already established their competitive presence in the world market. Therefore, their new entries to foreign countries are quite limited. Moreover, consistent with previous research, I assumed that if an action was reported as news in major media outlets like *Automotive News*, it represented a significant and newsworthy move from the acting firm. Consequently, I further assumed that two firms did not take any significant actions against each other if the action was not reported by *Automotive News*. Taking a game theoretic approach, the competitive implication of non-actions is as important as actions in an analysis of competitive rivalry. In the coding process, I first identified all the sample firms having competitive presence in a certain country market (one competitor is treated as having a competitive foothold in a certain country market, when at least one competitive move made by this competitor was coded during the period 1995 to 2001). Then I entered 0s to all the possible combination of competitor dyads in that country market when no actions between them were reported.

MEASUREMENT

This section discusses the measurement used for 1) two dimensions of competitive action: action volume and action complexity; 2) measures of organizational and environmental characteristics that are proposed to be antecedents of multinational rivalry in Chapter VI; 3) measures of important control variables.

Action Volume

Consistent with prior research (Ferrier, 2001; Ferrier et al., 1999; Young et al., 1996), action volume was measured as the total number of competitive actions, regardless of type, a focal firm takes in a given year. As indicated above, this measure was aggregated differently for different units of analysis employed for hypothesis testing. In general, the greater the number of competitive actions, the greater the competitive aggressiveness.

Action Complexity

Building on Miller and Chen's Range index (Miller & Chen, 1996), to measure the degree to which a firm carried out a broad range (as compared to a narrow range) of competitive actions, I counted the total number of types of actions undertaken by a firm in a given year (scored from 1 to 9). Similar to action volume, this measure was also aggregated differently for different units of analysis. Firms that undertake a wider variety of actions than their rivals are considered more aggressive.

Subsidiary Control

Subsidiary control represents the degree of control that an MNE's headquarters has over its subsidiary through equity. Following Curhan, Davidson and Suri (1977) and

Delios and Henisz (2000), I created three dummy variables to capture the different types

of control structures using the equity holdings of sample firms over their foreign

subsidiaries: minority joint venture (<50%), co-owned or majority joint venture (>=50%

but<95%), and wholly owned subsidiary (>=95%).

MNE Size

MNE size was measured by the annual world vehicle production of each sample

firm for each year. This measure was transformed with a log function to reduce skewness.

Cultural Distance

Similar to the cultural distance measure introduced by Kogut and Singh (1988), I

developed a composite index of cultural distance based on the four cultural dimensions of

the Hofstede index—power distance, uncertainty avoidance, masculinity/femininity, and

individualism.

$$CD_{jk} = \sqrt{\sum_{i=1}^{4} \left(I_{ij} - I_{ik} \right)^2}$$

Where CD_{jk} is the cultural distance of country j from country k, I_{ij} stands for the ith

cultural dimension for country j, I_{ik} stands for the ith cultural dimension for country k.

Government Regulations

The degree of government constraint on MNE operation was assessed using the

Executive Opinion Survey conducted each year by the World Economic Forum. To

represent the different aspects of a government's economic and political policy, four

variables were used to measure MNE managers' perceived restrictions to their business in

a country market where they operate. The first variable—access to credit—is the average

response of executives surveyed by the World Economic Forum to the statement "local capital markets are equally accessible to domestic and foreign companies." The second variable—hidden import barriers—is the average response of executives to the statement "Hidden import barriers other than published tariffs and quotas are not an important problem." The third variable—judiciary independence—is the average response of executives to the statement "The judiciary is independent and not subject to interference by the government and/or parties in a dispute." The last variable—government bureaucracy—is the average response of executives to the statement "Senior management spends very little of its time dealing with government bureaucracy."

To establish the robustness of my findings, I further performed a factor analysis of the four government regulation variables. A one factor solution was selected for hypothesis testing based on the traditional eigenvalue cutoff criterion of 1.0. This factor accounted for 55 percent of the variance in the government regulation data and had an eigenvalue of 2.21. The loadings for the variables were as follows: 0.80025 for hidden import barrier, 0.83197 for access to credit, 0.77963 for judiciary independence and 0.51482 for government bureaucracy.

Multimarket Contact

In the literature, there are three ways of measuring multimarket contact. *Market-level measures* capture the overall degree of multimarket contact among the firms serving a focal market. These measures have largely been used in industrial organization economics (Evans & Kessides, 1994; Feinberg, 1985; Hughes & Oughton, 1993; Jans & Rosenbaum, 1996; Singal, 1996). *Firm-in-market level measures* represent the overall

degree of multimarket contact between a focal firm and its focal-market competitors. These measures take the average, or weighted average of the multimarket contact of the focal firm with each of its competitors in the focal market. Examples of this type of measure can be found in Barnett (1993), Baum and Korn (1996), Boeker et al., (1997) and Gimeno and Woo (1996). Finally, *dyad measures* reflect the overall degree of multimarket contact between two firms across all the markets where both firms are present.

As noted by Baum and Korn (1999), multimarket contact is "not an aggregate property of industries, markets or firms; it is a property of the relationship between two firms." Given the theoretical focus and unit of analysis of this research, the dyad measurement of multimarket contact was ultimately selected.

Additionally, following the dyad measurement of multimarket contact introduced by Baum and Korn (1999), I incorporated information on the significance of particular markets to a firm by defining the measure of multimarket contact so that each market contact between a pair of firms was weighted by the significance of the markets to the firms themselves. To measure the significance of a given market in a firm's global strategic profile, I divided the sales of this firm in the market by the world total sales. More specifically, the following measure was used to capture the level of multimarket contact between two firms i and j at time t:

$$MMC_{ijt} = \frac{\sum_{Mit} [C_{imt} \times (D_{imt} \times D_{jmt})] + \sum_{Mjt} [C_{jmt} \times (D_{imt} \times D_{jmt})]}{2}$$

for all $\sum M_{it} (D_{imt} \times D_{jmt}) > 1$, otherwise$=0$

where m denotes a given market in the set of markets M_{it} or M_{jt} served by firms i and j respectively, at time t. C_{imt} and C_{jmt} are the centralities (strategic importance) of market m to firm i and j at time t. D_{imt} and D_{jmt} are indicator variables set equal to one if firms i and j are active in market m at time t and zero otherwise.

Control Variables

A number of control variables were included to control for the impact of MNE international experience, MNE age and the attractiveness of a given market on multinational rivalry.

First, prior research suggests that the age of a firm is likely to influence its strategic flexibility to take actions (Aldrich & Auster, 1986; Baker & Cullen, 1993; Knickerbocker, 1973). Older firms may have simpler competitive repertoires than younger firms and are more conservative in initiating aggressive actions. In this study, the age of a firm is measured by years since founding, as reported in *Who Owns Whom—Directory of Corporate Affiliations*. I transformed this measure with a log function.

Second, studies examining the stability of market shares have suggested that high-growth industries experience less market share stability and greater turnover in industry leadership than low-growth industries (Caves & Porter, 1978; Mueller, 1986). Extending this finding to a global context, one would expect that firms in an economically high-growth country engage in more rivalrous actions than do firms in a low-growth country. To control for the impact of the attractiveness of a country market on multinational rivalry, five variables widely used in international business literature are added to my regression model: 1) purchasing-power-adjusted *per capita level of GDP*

reported in World Development Indicator database, and this measure was transformed with a log function; 2) annual percentage growth rate of GDP reported in World Development Indicator database; 3) cultural openness, which was measured by the average response of executives surveyed by the World Economic Forum to the statement "your country is open towards foreign cultures"; 4) exchange rate volatility, which was measured by the average response of executives surveyed by World Economics Forum to the statement "Over the next two years, your country's exchange rate will be very stable." 5) market size, which was measured by the annual sales of vehicles in a given country market each year, and this measure was transformed with a log function.

Third, the impact of international experience on a variety of MNE activities has been extensively explored in international business research. Erramilli (1991) showed that firms with more international experience tend to have more confidence in their own abilities to manage and evaluate market risks. Li (1995), Delios and Beamish (2001), and Anand and Khanna (2000) all similarly found a positive relationship between international experience and survival. With regard to the effect of international experience on competitive activity, Chen and Stucker (1997) argued that firms with extensive international experience have a better awareness of local and international markets and varying cultural and institutional norms. This knowledge and understanding enables them to formulate and respond to competitive actions more readily against rivals in various countries. Thus I controlled for the influence of a firm's international experience, which was measured by the total number of subsidiaries that an MNE has all over the world

reported in *Who owns whom—the directory of corporate affiliations*. I transformed this measure using a log function to reduce skewness.

OVERVIEW OF THE STATISTICAL ANALYSIS

This section briefly describes the statistical methodology used in this dissertation. Due to the particular data structure, a combination of time series and cross-sectional data at different levels of aggregation, feasible generalized least squares (FGLS)—as one important method to analyze panel data—was selected to test the hypotheses generated in Chapter VI.

According to Sayrs (1989), a time series is a numerical sequence, where the interval between observations on a set of variables (X_t and X_{t+1}) is constant and fixed. A cross-section is a unit of analysis at a single point in time for which there exists observations on a set of variables ($X_i…X_n$). When the variables for a number of different cross-sections are observed over a time span, the resulting data matrix is called a pooled time series or panel data. In this dissertation, based on the units of analysis, the cross-sectional unit in different Datasets was defined differently. For instance, in Dataset 1 the cross-sectional unit is the firm-country market pair. Thus, an example of a cross-sectional unit would be the actions that GM undertook in the US. In Dataset 2 the cross-sectional unit is the focal firm-competitor-country market. An example of a cross-sectional unit then would be the actions that GM undertook against Toyota in the US. While in Dataset 3 the cross sectional unit is the competitor dyad. Accordingly, an example of a cross-sectional unit would be the actions that GM undertook against Toyota.

The methodology of analyzing panel data is a set of statistical techniques based on the theory of linear statistical models which focuses on estimating statistical relationships using panel data samples. The general form of a panel data model with N cross-sectional units over T periods is:

$$Y_{nt} = \alpha_{nt} + \beta_{nt}' X_{nt} + u_{nt} \qquad [1]$$

where n = 1…. N cross-sections

t = 1….T time points

There are numerous ways to conduct panel data analysis, among which, the fixed effects model and the random effects model are arguably the most popular approaches widely used by economics and management scholars. The fixed effects model, which is also called the Least Squares Dummy Variable model, captures variation unique to the cross-sectional unit in an intercept that varies from cross-section to cross-section. The random effects model is also called the Error Components model, in which the variation in the magnitude and the direction of the relationship among the cross-sections is assumed to be random but is captured and specified in the error term explicitly (Greene, 2003).

There is no clear rule of thumb to decide when to use fixed or random effects. Mundlak (1978) argues that we should always treat the individual effects as random. The fixed effects model is simply analyzed conditionally on the effects present in the observed sample. One can argue that certain institutional factors or characteristics of the data argue for one or the other, but unfortunately, this approach does not always provide much guidance. From a purely practical standpoint, the fixed effects approach is costly in terms of degree of freedom left, and in a wide, longitudinal data set, the random effects model

has some intuitive appeal. On the other hand, the fixed effects approach has one

considerable virtue. There is no justification for treating the individual effects as

uncorrelated with the other regressors, as is assumed in the random effects model. The

random effects treatment, therefore may suffer from the inconsistency due to omitted

variables (Greene, 2003).

Considering the tradeoff between a fixed effects and a random effects model,

similar to previous research on competitive dynamics (Ferrier, 2001; Ferrier et al., 1999),

I chose the FGLS estimator of the random effect model for the following reasons: First, if

there are any regressors that do not vary within the groups, the fixed effects estimator

cannot be computed. In this dissertation, variables such as cultural distance and subsidiary

control do not vary over time. These variables would have to be dropped if I ran a fixed

effects model. However, I can still estimate the random effects variance components

(Greene, 2003).

Second, to compare the advantages and disadvantages of different statistical

methods, before choosing FGLS, I first ran OLS regression and the analysis produced a

Durbin-Watson statistic which indicated the presence of serial correlation. Furthermore,

heteroskedasticity was also detected from the scatterplots of standardized predicted values

with the standardized residuals. In classical regression analysis, an OLS estimator is not

optimal in the presence of non-constant errors. However, the model can still be estimated

using generalized least squares (GLS), if the true variance covariance matrix is known.

Since in practice, we do not normally have knowledge of the error process, FGLS is

widely used because it uses an estimate of the true variance covariance matrix, avoiding the GLS assumption that the error process is known[5] (Beck & Katz, 1995).

FGLS allows estimation in the presence of autocorrelation within panels and heteroskedasticity across panels. Using two sequential transformations, FGLS first eliminates serial correlation of the errors, and then eliminates contemporaneous correlation of the errors. This is done by initially estimating equation (1) by OLS. The residuals from this estimation are used to estimate the unit specific serial correlation of the errors, which are then used to transform the model into one with serially independent errors. Residuals from this estimation are then used to estimate the contemporaneous correlation of the errors, and the data is once again transformed to allow for OLS estimation with now constant errors (Parks, 1967).

SUMMARY

This chapter described the method used to select the sample industry and firms, the ways that competitive actions were identified, the measures employed to gauge the important variables and an overview of the statistical analysis. The empirical results of the study are provided in the following chapter.

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[5] It should be noted that FGLS method was criticized by Beck and Katz (1995) for the possibility that its standard errors understate true sampling variability. Beck and Katz instead suggested to use OLS parameter estimates with asymptotic standard errors that are corrected for correlation between the panels. Using the STATA command xtpcse, I ran OLS/Prais-winsten models with panel-corrected standard errors on my data and obtained similar results as FGLS.

CHAPTER VI

RESULTS

This chapter is divided into two sections. The first section reports the descriptive statistics and correlations among the variables included in three Datasets employed by the present study. The second section presents the results of nine hypotheses developed in Chapter IV.

DESCRIPTIVE STATISTICS

Table 6.1 demonstrates means, standard deviations and correlation coefficients of the variables identified in Dataset 1. As indicated above, Dataset 1 was created to test hypotheses regarding the impact of subsidiary control, MNE size, cultural distance between home and host markets, host government constraint and home government protection on MNE competitive action. Dataset 1 consists of one observation per firm per country market per year for the entire sample window (n=1,491) (1995-2001). Multicollinearity between variables was checked carefully[6].

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[6] I dropped two variables—international experience (which was measured by the total number of subsidiaries that an MNE has worldwide) and purchasing-power-adjusted *per capita level of GDP*. Although theoretically these two variables were suggested to have distinct effects on multinational rivalry, due to the data availability, the measures I have used to measure them make them highly correlated with variables such as MNE age, market size and GDP growth rate. Since their theoretical boundaries become highly overlapped with existing variables, I decided to drop them and I strongly encourage future researchers to try alternative measures when they are able to collect related data.

Table 6.2 and Table 6.3 report means, standard deviations and correlation coefficients of the variables identified in Dataset 2 and Dataset 3 respectively. Using focal firm-competitor-country market-year as the unit of analysis, Dataset 2 was constructed to examine the main effect of cultural distance between rivals and the moderating effect of country of origin on multinational rivalry. Dataset 2 consists of one observation per focal firm-competitor dyad per country market per year for the entire sample window (n=12,508) (1995-2001). By contrast, variables included in sample 3 were related to hypotheses concerning the role of multimarket contact played in MNE competitive action, in which the unit of analysis was focal firm-competitor-year. Dataset 3 consists of one observation per firm rival dyad per year for the entire sample window (n=1,006) (1995-2001).

Stigler said "The plural of anecdote is data" (1964). Having the most detailed information on competitive action exchanged between sample firms, Dataset 2 is the fundamental dataset of the present study, from which, Dataset 1 and Dataset 3 were created using a different level of aggregation. To better capture the basic information "told" by this dataset, I provided descriptive figures and frequency tables in addition to the summary statistics displayed in Table 6.2. In the following section, the important aspects of Dataset 2 will be discussed in turn.

Figure 6.1 visually presented the distribution of nine types of competitive action in Dataset 2. Among the 5,188 competitive actions initiated by sample firms during 1995 to 2001, there were 138 capacity actions (2.66%), 26 actions concerning changing organizational structure and management systems (0.5%), 106 actions concerning

improving distribution and after-sales service (2.04%), 138 diversifications (2.66%), 544 actions concerning international expansion (10.49%), 460 marketing actions (8.87%), 2,396 new product actions (46.18%), 512 pricing actions (9.87%) and 868 actions concerning technology innovation (16.73%). Overall, it seems that new product action, which includes adding new product features and introducing new models, is the competitive action most frequently taken by global automakers. By contrast, pricing action (price cut or price increase) was found by prior studies as the most favorable tactic airlines would use in the competition. For instance, of the16 types of competitive moves Chen (1988) was able to identify in the US airline industry between 1979 and 1986, pricing action accounted for over 50%. It is not a surprise that firms in different industries will compete differently. This supports the earlier contention that it is important to expand existing competitive dynamics research beyond the US domestic airline industry to other competitive contexts.

The distribution of three types of subsidiary control in Dataset 2 was visually presented in Figure 6.2, from which we can see that majority of the sample firms chose to set up wholly owned subsidiaries when they entered foreign markets. Given that most of the countries included in this research are developed countries (a list can be found in Appendix E), where government restriction on foreign ownership is quite weak relative to many developing economies, my data seemed to suggest that global automakers tend to favor wholly owned subsidiary (82%) over other entry modes such as minority joint venture (8%) and majority joint venture (10%) when they do have such a choice in a foreign country market.

Table 6.4 summarized the distribution of competitive action in different countries. Among the 5,188 competitive actions initiated by sample firms between 1995 and 2001, 93 actions occurred in China (1.79%), 563 actions occurred in France (10.85%), 512 actions occurred in Germany (9.87%), 97 actions occurred in India (1.87%), 503 actions occurred in Italy (9.7%), 315 actions occurred in Japan (6.07%), 161 actions occurred in Poland (3.10%), 199 actions occurred in Russia (3.83%), 410 actions occurred in Spain (7.90%), 96 actions occurred in Thailand (1.85%), 485 actions occurred in UK (9.35%) and 590 actions occurred in US (11.37%). Not surprisingly, firms competed very fiercely in countries such as US, France, UK, Germany and Japan, where they have well established dealer networks, manufacturing facilities and relatively stable customer groups. However, it should also be noted that, as shown in Table 6.4 more and more firms begin to realize the importance of expanding into developing economies with great growth potential. As a result, we can observe a reasonable amount of competitive moves untaken in countries such as China, Russia, Brazil and India.

The proportions of competitive actions initiated by sample firms in the global automotive market during seven-year period were visually presented in Figure 6.3. From which we can see that General Motors, Ford, Volkswagen and Toyota are the most active players in the industry. By contrast, the less competitive moves made by Daimler-Chrysler and Nissan relative to their compatriot rivals are quite unexpected.

In addition to Figure 6.3, Appendix F provided information on competitive exchanges for 78 competitor dyads (n=13x6) from Jan. 1995 to Dec. 2001. As a useful way to visualize the competitive relationship between sample firms, these charts revealed

many interesting competition phenomena which deserve attention for future research. First, as illustrated in the chart, significant competitive asymmetry seems to exist between different pairs of rivals. For instance, consider the competitive interaction between Hyundai and Ford as an example. The number of competitive actions initiated by Hyundai against Ford was far more than the actions Ford initiated against Hyundai. Even though the notion of competitive asymmetry has interested a great number of scholars in strategic management, much more remains to be done in expanding current research to an international arena. Second, according to the chart, competitive actions undertaken by sample firms seemed to concentrate on certain months during a year. In particular, November and December were two months that tended to have the most competitive actions. Why is this the case in the auto industry? Is it possible to find time-dependent clustered competitive behavior in other industries? Answers to these questions surely will contribute to our understanding of competitive exchanges occurring in different settings. Finally, as shown in the chart, we can see many interesting disruptive points in the competitive relationships between certain firms. For instance, before 1998, there were not many competitive interactions between Volkswagen and Chrysler. After 1998 however, the competitive intensity between these two firms seemed to increase significantly. In fact, this is not difficult to understand if we consider the acquisition between Chrysler and Daimler-Benz. Since the acquisition, Chrysler has established significant competitive presence in Europe using Daimler-Benz's sales networks and production facilities, which makes it a direct threat in Volkswagen's backyard. Moreover, consider another example of a "disruptive event" which can be traced from the chart. After Chrysler purchased 34%

of Mitsubishi's equity in Jan. 2000, no competitive actions were observed between this pair of competitors. Did the equity alliance eliminate the competition? Is it possible for rivals to compete and cooperate at the same time? As a first step toward resolving these interesting and novel research questions, the information included in Appendix F provides intuitive answers which need further investigation in the future.

RESULTS OF HYPOTHESIS TESTING

This section presents the empirical results of testing Hypotheses 1 through 9, in which the relationships between various organizational and environmental characteristics and two dimensions of competitive actions—action volume and action complexity—were examined. To test these hypotheses, FGLS regression was run on the three datasets created for different units of analysis. Basically, I conducted FGLS analyses on two dimensions of competitive action—action volume and action complexity separately. For the analysis related to each of these two action characteristics, I first ran an FGLS regression with only the independent variables entered as predictors. Then I added all the control variables to the model. Next, I entered one interaction term at a time. Lastly, I reported a fully specified model containing all the variables and interaction terms.

Table 6.5 reports tests of Hypotheses 1a, 1b, 2a, 2b, 4a, 4b, 5a, 5b, 7a and 7b, in which five independent variables—subsidiary control, MNE size, cultural distance between home and host markets, host government constraint and home government protection—were regressed on action volume and action complexity separately. Overall,

except for subsidiary control, as theory predicted, large MNE size[7], cultural similarity between home and host country market, less restrictive host government regulation and strong home government protection all significantly increase the competitive aggressiveness of a focal firm in a given country market.

Table 6.6 and Table 6.7 report tests of Hypotheses 3a, 3b, 6a and 6b, in which the impact of cultural distance between rivals and the moderating effect of country of origin were examined. As expected, a focal firm will compete more aggressively (in terms of action volume and action complexity) with rivals from culturally similar countries than with rivals from culturally distant countries. Regarding the effect of interaction of cultural distance between rivals and host government constraint, no statistically significant relationship was found from the analysis of Dataset 2.

Furthermore, by retesting the hypothesized effect that subsidiary control, MNE size, cultural distance between home and host markets, host government constraint and home government protection may exert on multinational rivalry in Dataset 2 at a different level of analysis, Table 6.6 and Table 6.7 provide additional support to those hypotheses confirmed in the analysis of Dataset 1. It should be noted that, in contrast to the results derived from Dataset 1, the hypothesized relationship between subsidiary control and MNE competitive action received partial support from the analysis of Dataset 2.

Finally, Table 6.8 reports the effect of multimarket contact on action volume and action complexity, as predicted by Hypotheses 8a, 8b, 9a and 9b. Opposite to what theory

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[7] Opposite to what theory has predicted, MNE size was shown to have a positive effect on an MNE's action complexity (a detailed discussion can be found in Chapter VII).

suggested, the mutual forbearance hypothesis, which has been widely supported empirically and theoretically by prior competition research was not supported in the global automotive industry. Instead, global automakers compete more aggressively against each other as the degree of market overlap between them increases. Moreover, the hypothesized moderating effect of country of origin was not supported either. While the relationship was statistically significant, the direction was opposite to that hypothesized. According to the empirical results from Table 6.8, culturally similar rivals actually compete more aggressively than culturally distant rivals when they have high multimarket contact with each other.

Overall, as shown in Tables 6.5 through 6.8, the theoretical model of multinational rivalry suggested in Chapter III and the associated hypotheses developed in Chapter IV were generally supported by the data. In the following section, I review the statistical evidence of each hypothesis in turn.

> *Hypothesis 1a: The degree of subsidiary control that an MNE headquarters has over its subsidiary in a given country market is positively related to its action volume in that country market.*

> *Hypothesis 1b: The degree of subsidiary control that an MNE headquarters has over its subsidiary in a given country market is positively related to its action complexity in that country market.*

Hypothesis 1a and 1b suggest a positive relationship between subsidiary control and an MNE's action volume and action complexity. To test this set of hypotheses, I used two dummy variables: minority joint venture and majority joint venture (the competitive action of wholly owned subsidiary is estimated by the intercept of the equation). As demonstrated in Tables 6.5 through 6.7, the first set of hypotheses was partially supported.

While the coefficients for majority joint venture were not significant in either Dataset 1 and Dataset 2, the data seemed to support the existence of significant difference in competitive aggressiveness between an MNE having a minority joint venture and an MNE having a wholly owned subsidiary in the same country market (b= -0.26, p<0.1 in Model 2 of Table 6.5; b= -0.04, p<0.001 in Model 4 of Table 6.6 and b= -0.03, p<0.01 in Model 4 of Table 6.7). In sum, the evidence confirms the prediction that an MNE setting up a wholly owned subsidiary will compete more aggressively than an MNE only having a minority joint venture in the same country market.

> *Hypothesis 2a: The size of an MNE is positively related to its action volume in a given country market.*

> *Hypothesis 2b: The size of an MNE is negatively related to its action complexity in a given country market.*

Hypothesis 2a predicts that large MNEs are likely to undertake more competitive actions than small MNEs in a given country market. This prediction received strong support in all the analyses of three datasets. For instance, as displayed in Model 2 in Table 6.5, Model 4 in Table 6.6 and Model 3 in Table 6.8, MNE size was all positively related to action volume (b = 0.96, p<0.001 in Model 2 of Table 6.5; b = 0.09, p<0.001 in Model 4 of Table 6.6 and b = 1.44, p<0.001 in Model 3 of Table 6.8). Regarding the effect of MNE size on action complexity, opposite to what theory predicted, the MNE size was consistently found to have a strong positive impact on action complexity across all the analyses (b = 0.34, p<0.001 in Model 4 of Table 6.5; b = 0.09, p<0.001 in Model 4 of Table 6.7 and b = 0.52, p<0.001 in Model 6 of Table 6.8). Therefore, relative to small

MNEs, large MNEs will undertake a broader set of competitive devices in a given country

market and Hypothesis 2b was not supported.

> *Hypothesis 3a: The cultural distance between an MNE and its rival in a given country market is negatively related to its action volume in that country market.*

> *Hypothesis 3b: The cultural distance between an MNE and its rival in a given country market is negatively related to its action complexity in that country market.*

As predicted in Hypotheses 3a and 3b, the negative effect of cultural distance

between rivals on an MNE's action volume and action complexity was strongly

supported. Overall, cultural distance between rivals seemed to be a good predictor for the

asymmetric competitive relationships between multinational firms. It displayed a

consistent negative impact on MNE competitive action in all 14 models reported in Tables

6.6 through 6.8. For instance, as shown in Table 6.6 and Table 6.7 the coefficients for

cultural distance between rivals were negative and significant for both action volume (b =

-0.03, $p<0.001$ in Model 4 of Table 6.6) and action complexity (b = -0.03, $p<0.001$ in

Model 4 of Table 6.7). Accordingly, one would expect that Toyota will compete more

fiercely with Honda than competing with Renault in US due to the smaller cultural

distance between Toyota and Honda.

> *Hypothesis 4a: The cultural distance between the home country market of an MNE and the host country market in which its subsidiary competes is negatively related to its action volume in the host country market.*

> *Hypothesis 4b: The cultural distance between the home country market of an MNE and the host country market in which its subsidiary competes is negatively related to its action complexity in the host country market.*

With respect to cultural distance between home and host country market, its

negative impact on an MNE's competitive action, as suggested in Hypotheses 4a and 4b

received strong support from the analyses of both Dataset 1 and Dataset 2. Evidence

suggests that cultural distance between an MNE's headquarters and its foreign subsidiary

contributes substantially to explaining this MNE's competitive behavior in the foreign

country market. As indicated in Tables 6.5 through 6.7, coefficients for cultural distance

between home and host markets were significant for action volume (b = -0.32 in Model 2

of Table 6.5; b = -0.03 in Model 4 of Table 6.6); and action complexity (b = -0.08 in

Model 4 of Table 6.5; b =   -0.03 in Model 4 of Table 6.7) all at the 0.001 level.

> *Hypothesis 5a: The level of host government constraint is negatively related to an MNE's action volume in the host country market.*

> *Hypothesis 5b: The level of host government constraint is negatively related to an MNE's action complexity in the host country market.*

Hypotheses 5a and 5b predict that strong host government restriction diminishes

an MNE's motivation to compete aggressively. This set of hypotheses received substantial

support from the analyses of both Dataset 1 and Dataset 2. As reported in Table 6.5 and

Table 6.6, host government restriction was negatively related to both action volume (b =

-0.80, p<0.001 in Model 2 of Table 6.5; b = -0.01, p<0.001 in Model 4 of Table 6.6) and

action complexity(b = -0.19, p<0.001 in Model 4 of Table 6.5; b=   -0.01, p<0.001 in

Model 4 of Table 6.7).

> *Hypothesis 6a: The level of host government constraint is more negatively related to an MNE's action volume in the host country market when it competes with a culturally similar rival.*

> *Hypothesis 6b: The level of host government constraint is more negatively related to an MNE's action complexity in the host country market when it competes with a culturally similar rival.*

Hypotheses 6a and 6b suggest that the competition-reduction effect of host government restrictions on an MNE's competitive action will be stronger when the MNE is competing against a rival from culturally similar country. To test this set of hypotheses, I created a multiplicative term to capture the interaction of cultural similarity between rivals with host government constraint. Possibly due to the small variance in sample firms' country of origin (in this research, the 13 sample firms come from only 6 countries in total—US, Japan, Korea, Italy, Germany and France), none of the coefficients for the interaction term was statistically significant for action volume and action complexity, even though all were positively signed, as expected. Therefore, Hypotheses 6a and 6b were not supported.

> *Hypothesis 7a: The level of government protection at home is positively related to an MNE's action volume in the host country market.*

> *Hypothesis 7b: The level of government protection at home is positively related to an MNE's action complexity in the host country market.*

Hypotheses 7a and 7b predict a positive relationship between the level of an MNE's home government restriction and its action volume and action complexity in the host country market. Having their home country market well protected by the government regulation, according to this set of hypotheses, MNEs will be more willing and more motivated to compete aggressively in foreign countries. Overall, Hypotheses 7a and 7b were strongly supported, as home government restriction was found to be positively related to both action volume (b = 0.85, p<0.001 in Model 2 of Table 6.5; b = 0.02, p<0.001 in Model 4 of Table 6.6)and action complexity (b = 0.22, p<0.001 in Model 4 of Table 6.5; b = 0.02, p<0.001 in Model 4 of Table 6.7).

Hypothesis 8a: The level of multimarket contact between an MNE and its rival is negatively related to the MNE's action volume against this rival.

Hypothesis 8b: The level of multimarket contact between an MNE and its rival is negatively related to the MNE's action complexity against this rival.

As discussed in Chapter V, two sets of hypotheses (Hypothesis 8 and 9) predicting the impact of multimarket contact on MNE competitive action were tested in Dataset 3, in which the unit of analysis is focal firm-competitor-year. Extending multipoint competition research to an international context, Hypotheses 8a and 8b suggest that two firms will mutually forbear from competing aggressively against each other as the level of multimarket contact between them increases. Overall, empirical results did not support this prediction. The coefficients for multimarket contact were statistically significant, but consistently positively signed in all models reported in Table 6.8, which indicates that multinational firms will compete aggressively against each other as the degree of market overlap between them is high.

Hypothesis 9a: The level of multimarket contact between an MNE and its rival is less negatively related to the MNE's action volume when the rival is from a culturally similar country.

Hypothesis 9b: The level of multimarket contact between an MNE and its rival is less negatively related to the MNE's action complexity when the rival is from a culturally similar country.

Hypotheses 9a and 9b predict that cultural distance between rivals will interact with multimarket contact to influence the competitive action of an MNE. More specifically, this set of hypotheses argues that the competition-reduction effect of multimarket contact will be weaker when an MNE is competing against a culturally similar rival. As presented in Table 6.8, the coefficient for the interaction term was

statistically significant but in a direction opposite to that hypothesized. Therefore, the results suggest that the influence that multimarket contact exerts on action volume and action complexity will become even stronger when the MNE is competing against a rival with a similar cultural background. Thus, Hypotheses 9a and 9b were not supported.

Regarding the impact of control variables included in the present study, GDP annual growth rate, market size and exchange rate volatility displayed a consistent and significant influence on MNE's competitive action in all models reported in Tables 6.5 through 6.7. All else equal, an MNE will compete more aggressively in a country market with a fast growing economy, reasonably large automotive market and low exchange rate volatility. By contrast, neither MNE age nor cultural openness showed any significant association with an MNE's action volume and action complexity.

SUMMARY

This chapter presents the empirical evidence regarding the antecedents of multinational rivalry. A summary of all the empirical results can be found in Table 6.9. As predicted by the theoretical model developed in Chapter III, evidence supports that subsidiary control plays an important role in explaining the competitive aggressiveness of MNEs. The size of an MNE is also a good predictor for its competitive behavior across countries. Consistent with previous research, cultural similarity between rivals as well as between home and host markets increase the action volume and action complexity of an MNE. With respect to the effect of government regulation, strong host government restriction diminishes an MNE's tendency to compete aggressively in the host country market. Strong home government restriction however, promotes aggressive competitive

actions among domestic firms in foreign countries. Interestingly, no hypothesis related to

multimarket contact was supported in the present study, which suggest a promising

direction for future research. A further discussion of these empirical results will be

presented in the next chapter.

CHAPTER VII

DISCUSSION, SUMMARY AND IMPLICATIONS

This final chapter includes the following sections: 1) discussion, 2) implications, 3) limitations, 4) future research directions. The discussion section summarizes what has been found and what can be learned from the empirical results presented in the preceding chapter. The second section discusses the implications of this study from both a strategy researcher and a managerial practitioner's viewpoint. The emphasis for strategy researchers concentrates on both research content and methodology; for managerial practitioners, the focus changes to strategic suggestions which may help them compete more effectively in a global context. The section on limitations highlights some unresolved problems of this study. Future research directions are proposed in the last section.

DISCUSSION

Focusing on the individual competitive action, the primary purpose of this research is to explain the competitive actions of multinational firms in a global context. Taking a multidisciplinary and integrative approach, various organizational and environmental characteristics were proposed as important antecedents of multinational rivalry. In the following section, each of these characteristics is evaluated in terms of its impact on the two dimensions of an MNE's competitive action—action volume and action complexity.

Subsidiary Control

Subsidiary control in the present study was defined as the extent to which an MNE subsidiary's decisions and actions are shaped by its headquarters. According to the theoretical model of multinational rivalry developed in Chapter III, strong subsidiary control facilitates information flow and resource transfer within an MNE and therefore increases the motivation and capability of an MNE's subsidiary to compete in a local market. The empirical evidence reported in Chapter VI partially supports the argument that there is a positive impact of subsidiary control on an MNE's action volume and action complexity. Within the same country market, the competitive aggressiveness of an MNE having a minority owned joint venture (<50%)was found to be significantly different from that of an MNE having a wholly owned subsidiary (>95%). However, the differences in competitive action between an MNE having a majority owned joint venture (>50% and <95%) and an MNE having a wholly owned subsidiary were not significant. This result might be explained by the following reason. Constrained by data availability, there is not enough variance in subsidiary control structure among sample firms. In contrast to previous research (Delios & Henisz, 2000), most countries from which I was able to collect data on sample firms' ownership structure were developed countries. As showed in Figure 6.2, of all the subsidiaries that sample firms had in 28 countries, about 82% of them were wholly owned.

The use of single measures for all the variables is one of the possible limitations of this study. In fact, in addition to the equity arrangement—a measure widely used to capture the degree of control that an MNE headquarters has over its subsidiaries—several

plausible alternative measures can also be found in the literature. For instance, Kobrin

(1991) developed an index to measure the degree of an MNE's transnational integration,

using the ratio of intrafirm trade to an MNE's total international sales. Furthermore, in his

research examining the impact of international corporate strategy on multinational firms'

entry modes, Hazring (2002) identified four categories of MNE control

mechanisms—personal centralized control, bureaucratic formalized control, output

control and control by socialization and networks. Thus, the use of control measures

beyond equity holding could contribute importantly to future research on multinational

rivalry.

MNE Size

MNE size was hypothesized to have a positive effect on an MNE's action volume.

The results reported in Chapter VI provide strong support for this prediction. Relative to

their smaller rivals, abundant slack resources give a large MNE more ability to attack

competitors and withstand intensified competition. Regarding the impact of MNE size on

its action complexity, opposite to what theory predicted, the empirical evidence suggests a

positive relationship between an MNE size and its action complexity. In fact, this finding

can be interpreted in the following two ways. First, the present study used the annual

world product to measure the absolute size of sample firms. Results might be different if

relative size measures or alternative absolute size measures were used. Second, compared

with their smaller rivals, large MNEs have accumulated more competitive experiences

through exposure to a variety of competitors and customers in different national markets.

They know how to compete using a broad arsenal of weapons. Having tried out many

different competitive methods, large MNEs are more capable of developing the skills to compete in a more multifaceted way. Their managers could also have formed some political or economic commitments towards a larger set of competitive tools. In contrast, small MNEs may have less international experiences than their large rivals. They may be less aware of the potential of alternative competitive methods and therefore lack the knowledge to implement them. As a result, they will choose to concentrate on fewer modes of competition.

Due to limited data availability, in the present study MNE size was measured by the annual total production of the MNE worldwide. However, many other relative size measures, such as the proportion of an subsidiary's number of employees to the total number of employees of an MNE, or the proportion of an subsidiary's sales to the total foreign sales of an MNE, are observed in the literature. Although the data to construct these measures are not available at this time for my sample, it would be worthwhile to consider these alternative measures for scholars conducting global competition research in the future.

Finally, as suggested by Chen and Hambrick (1995), small firms and large firms may employ different tactics to compete. In particular small firms have a greater need than their larger rivals to act aggressively and to challenge the status quo in the market place. Instead of initiating large-scale competitive actions, small firms are more likely to undertake frequent strategic skirmishes to challenge their larger rivals' reputations. Taking a game theoretic approach, Casson (1987: 51) argued that, "A technologically advantaged firm in a global industry confronts a technologically weak firm. Although

disadvantaged, the weak firm is not entirely without power, because it can spoil the strong firm's home market. The weak firm defends itself, therefore, not in its own home market where it is under attack, but through counter-attack in the strong firm's home market. It does this because it believes that the strong firm has more to lose in its own home market than it has to gain by aggression overseas." Constrained by the scope of this research, only two dimensions of an MNE's competitive action were examined. Much more remains to be done to refine the present study by investigating the different competitive devices used by firms of varying sizes.

National Culture

Understanding cultural distance is key to conducting global research. Despite extensive studies on cultural distance, limited effort has been made to examine the impact of national culture on multinational rivalry. To fill this gap in the literature, the theoretical model developed in Chapter III investigated the role of national culture played in global competition by suggesting the following two hypotheses: First, cultural distance between a focal firm and its rival decreases action volume and action complexity as the firm engages the rival in a given country market. Second, when an MNE operates in a culturally distant country market, the cultural distance between home and host country market diminishes its motivation and capability to compete. Overall, results reported in Chapter VI strongly support these two hypothesized relationships between cultural distance and MNE competitive action.

The present study used the Hofstede index to measure cultural distance between rivals as well as between home and host markets. The Hofstede index includes five

dimensions: individualism-collectivism, uncertainty avoidance, power distance, masculinity-femininity and long-term vs. short-term orientation. Consistent with previous research, I created an aggregated measure of cultural distance based on the four dimensions of the Hofstede index (individualism, power distance, uncertainty avoidance and masculinity). In fact, to verify the choice of measure, I ran separate set of FGLS using each of the four dimensions of the Hofstede index. The results were reasonably consistent with what was reported using only the aggregated measure. Despite its popularity, the Hofstede index has been widely criticized (Shenkar, 2001). As a result, a number of alternative measures such as Ronen and Shenkar (1985)'s culture-cluster index and Schwartz (1994) cultural value index were considered. Finally, I decide to rely on the value scheme developed by Hofstede (1980; 1990), due to its particular relevance to my research question and the fact that it had the least number of missing values for the countries included in my sample.

Host Government Constraint

Host government constraint was proposed to be negatively related to an MNE's action volume and action complexity. The empirical results reported in Chapter VI provide substantial support to this set of hypotheses. As indicated before, when firms compete with each other across borders, market conditions are significantly different from those in a domestic setting. Perhaps the most critical determinants of market conditions are the constraints imposed by varying government regulations. Despite its importance to competitive activity, the linkage between government regulations and multinational rivalry has been largely ignored in the literature. Thus, both the theory development and

the empirical findings of this study regarding the importance of government policy in shaping MNE competitive behavior contribute valuable insights to both MNE and competition literature.

Although the negative main effect of host government constraint on action volume and action complexity was consistently confirmed in 12 models reported in Chapter VI, the interaction of host government constraint with cultural similarity between rivals did not have a significant impact on multinational rivalry. The lack of support for this interaction effect suggests that competing with a culturally similar rival does not necessarily strengthen the negative effect of host government constraint on a focal firm's competitive aggressiveness. This result can be interpreted in two ways. First, as shown in Appendix E, the 13 sample firms selected by this research come from 6 different countries in total. The limited variance of cultural distance between rivals likely hampers the impact this interaction term might exert on an MNE's action volume and action complexity for this sample setting. Second, the insignificant interaction effect between host government constraint and cultural similarity between rivals provides additional support to Hypotheses 3a and 3b, in which culturally similar rivals are proposed to compete more aggressively with each other due to the ease of understanding of competitive signals and similar strategic competencies within the competitive pair.

In supplemental analyses (not proposed in the theoretical model developed in Chapter III), I tested for the possible impacts other contingency variables might exert on multinational rivalry. I added a dummy variable, local rival (which is coded as 1 if the focal firm is competing with a local competitor and 0 otherwise), to capture the

competitive asymmetry existing between different pairs of competitors. According to the exchange of threat model developed by strategic interaction theory (Casson, 1987; Graham, 1990; Veugelers, 1995) and the sphere of influence effect suggested by the multimarket competition literature (Gimeno, 1999; Simmel, 1950), a focal firm can strategically use its subordination in a rival's important market in exchange for this rival's subordination in its important market. Viewing the home market as the most important market for an MNE to defend, a foreign MNE is expected to compete less aggressively with a local firm than with a non-local firm, in exchange for the local firm's less competitive behavior in the MNE's home country market. As displayed in Table 6.6 and Table 6.7, the positive and statistically significant coefficient for local rival in all 6 models indicates that, opposite to what competition research has suggested, a foreign MNE will compete more aggressively with a local competitor than with a non-local competitor. In the literature, the empirical evidence regarding the exchange of threat model has not been completely consistent and most of the studies conducted have been case-based or descriptive by nature. By contrast, the idea of sphere of influence has received general support from a significant number of studies using domestic industries as the empirical setting. Therefore, the contradictory, and to a certain extent surprising results suggest by the present study point out interesting directions for future research.

As shown in Model 4 of Table 6.6 and Table 6.7, in addition to examining the effect of local rival, the interaction of local rival with host government constraint was also added to the regression equations. Competition theory predicts that, because of the sphere of influence, the negative impact of host government restriction on a foreign MNE's

competitive action will be stronger when it competes with a local rival. This prediction was not supported, as indicated by the positive (as expected) but insignificant coefficient of this interaction term for both action volume and action complexity. Thus, the negative effect of host government restriction on an MNE's competitive action is not necessarily stronger when the MNE is competing with a local rival, at least for my sample.

Home Government Protection

The government protection at home was hypothesized to have a significant impact on an MNE's competitive action in a host country market. As supported by the results displayed in Chapter VI, the strong positive effect of home government restriction on an MNE's action volume and action complexity suggests that, when the domestic market of a foreign MNE is well protected by its home government, it will be more willing and capable of competing in the host country market. This finding is consistent with the argument of strategic trade theory in the international business literature (Brander, 1986; Brander & Spencer, 1985; Krugman, 1987). According to this research stream, a government strategically using its policy measures can offer its home firm an opportunity to shape the competitive environment in such a way as to improve its competitive position relative to foreign rivals.

In fact, national governments can impose a variety of restrictions and regulations, and these are very likely to vary across countries. Due to limited data availability, the present study concentrates on the effect of a government's defensive policy measures which may either protect its domestic market from foreign entry or constrain foreign MNEs' daily operation. In fact, different types of government regulations are likely to

influence domestic firms' competitive behavior differently. For instance, in addition to imposing diverse restrictions on MNEs' operations and thereby lowering competition at home, a government can directly help its home firms to open foreign markets by providing financial support, or by negotiating with the foreign government to secure better market access for home firms.

Consider U.S.-Japan trade frictions as an example. In a succession of bilateral negotiations since 1985, the U.S. government has demanded that the Japanese government reduce or eliminate barriers to a few industries where US companies are competitive on a global level but underrepresented in Japan (e.g. autos, computers). To Americans, the overarching goal of these negotiations is to improve U.S. access to the Japanese market, but not to reduce Japan's access to the American market. As an important player in global competition, a government's different types of regulation will influence an MNE's motivation and capability to compete differently. Therefore, it is important for future researchers to extend the current study by investigating the influence of other types of government policies on multinational rivalry.

Multimarket Contact

Consistent with research in the strategic management and industrial organization economics literatures (Bernheim & Whinston, 1990; Edwards, 1955; Evans & Kessides, 1994; Feinberg, 1984; Feinberg, 1985; Hughes & Oughton, 1993; Mester, 1987; Scott, 1982); (Barnett, 1993; Baum & Korn, 1996; Chen, 1996; Gimeno, 1994; Gimeno & Woo, 1996; Karnani & Wernerfelt, 1985; Porter, 1980; Smith & Wilson, 1995; Witteloostuijn & Wegberg, 1992), the multimarket contact between a focal firm and its rival was expected

to have a negative impact on the focal firm's competitive aggressiveness. Contrary to what theory predicted, the results reported in Chapter VI demonstrate a strong positive relationship between multimarket contact and an MNE's action volume and action complexity. More specifically, the empirical results suggest that as the degree of market overlap between a focal firm and its rival increases, the focal firm will fight more aggressively against this rival across national markets.

Two reasons seem likely to explain this result. First, as discussed in Chapter V, the present study used dyad measurement of multimarket contact. The empirical findings might be different if alternative measures were employed. Second, and more importantly, as the core of multimarket competition theory, the mutual forbearance hypothesis, which has been supported by a significant number of studies, seems difficult to sustain in a global context.

As a research argument that has long interested scholars from different disciplines, mutual forbearance, a form of tacit collusion in which firms avoid competitive actions against those rivals they meet in multiple markets, is proposed to occur as multimarket contact increases familiarity between firms and their ability to deter each other. As one of the basic premises underlying multipoint competition theory, the condition—ability to deter each other—has to be satisfied in order for the mutual forbearance hypothesis to work. Jayachandran, Gimeno and Varadarajan (1999) defined deterrence as the extent to which a firm is able to prevent its rivals from initiating competitive actions that may be harmful to its interests in the market. Mutual forbearance between two firms is likely to occur only when they hold credible threats of retaliation against each other. In such

situations, firms might not compete aggressively simply because the expected gains from aggressive moves may be lower than the future losses due to competitive retaliation. In effect, it is the "the shadow of the future" that creates a link between the future payoffs for a firm and its present actions. In a global context, the diverse cultural background compounded by extremely complex market conditions make unilateral cheating behavior much easier and more difficult to identify. As a result, the collusion or mutual forbearance between firms are quite difficult to sustain due to the weakened effect of "the shadow of the future".

Moreover, as indicated in Chapter III, multimarket competition will lead to mutual forbearance and lower intensity of competition between two firms only if each firm achieves effective coordination between the administrative units that manage the operations in all markets both firms compete in. In a multinational setting, geographic distance, differences in language and historical heritage and varying regulations and economic conditions make coordination within an MNE very difficult. For instance, for an MNE pursuing a multidomestic strategy, its subsidiaries are autonomous and are allowed to be very responsive to local markets. Hence, the intrafirm coordination essential to executing a corporate-level competitive strategy is not easy to achieve.

Finally, in their seminal work, Bernheim and Whinston (1990) insightfully noted that "when identical firms with identical constant-returns-to-scale technologies meet in identical markets, multimarket contact does not aid in sustaining collusive outcomes". Hence, the key to mutual forbearance is the asymmetry between markets, rivals and the competitive positions of rivals in the market. Whenever asymmetry is present, the effect

of multimarket contact resembles a transfer of enforcement power from one market to another. In an international arena, the competitive linkages across countries are quite limited, especially in a less globalized industry. In this context, a firm's competitive position in one country market is largely unrelated to its competitive position in another country market. As a result, the ability for a firm to transfer its market power from one country market to another may be quite restricted.

Taken together, given the challenge of satisfying the required conditions of mutual forbearance, the competition-reduction effect of multimarket contact is relatively difficult to achieve in a global competition. In fact, this logic might also explain the contradictory and equally unexpected negative interaction effect between multimarket contact and cultural similarity between rivals. As indicated by the results reported in Chapter VI, opposite to what theory predicted, competing against culturally similar rivals does not necessarily weaken the impact of multimarket contact on an MNE's competitive action.

IMPLICATIONS

This study has implications for both strategy researchers and managerial practitioners. This section is thus organized into 1) research implications, and 2) practical implications.

Research Implications

Contributions of this study are made to strategic management literature in the following two aspects: 1) research content, and 2) research methodology.

Research Content

The present study has several implications for research content. First, focusing on the individual competitive action, the overriding objective of this dissertation is to develop a framework to improve our understanding of multinational rivalry. As discussed in previous chapters, most prior competition studies implicitly assume cultural commonality and market homogeneity. Thus, it is important for scholars to extend current competition research to a much broader context and investigate the differences between domestic and global competition. Recognizing this gap in the literature, the present study examined the impact of a number of organizational and environmental characteristics, which have been largely ignored by existing literature, on multinational firms' competitive action. For instance, according to the theoretical model developed in Chapter III, when firms compete against each other across borders, factors such as strong corporate control over local subsidiaries, cultural distance between competitors, market diversity, and government regulation are all likely to influence the drivers of interfirm rivalry and therefore affect an MNE's competitive behavior. As one of very few studies on multinational rivalry in the strategic management field, the theoretical framework created in this dissertation and associated empirical findings provide an important first step to analyze the competitive actions of multinational firms across diverse country markets.

Second, according to Chen and Stucker (Chen & Stucker, 1997), the significance of various drivers of interfirm rivalry may vary across different cultural settings. Investigation into such variables as competitive action volume and action complexity, which have been highlighted in the competition literature, may yield different results

depending on the cultural and national context being studied. Thus, by applying the theoretical arguments of previous competition research to an international context, the present study not only helps scholars gain further understanding about the validity of these research streams, but also provides empirical evidence on the contingencies that might make prior theoretical predictions more or less likely to occur in a global competition. For instance, as shown from the results reported in Chapter VI, all else equal, strong home government protection significantly promotes domestic firms' competitive actions abroad, which provides direct support to strategic trade theory. Moreover, opposite to what the mutual forbearance hypothesis suggests, the multimarket contact between a focal firm and its rival was found to have a positive impact on the focal firm's competitive aggressiveness. Sitting as the core of multimarket competition theory, the mutual forbearance hypothesis has been confirmed by a large number of studies using only domestic industry as their empirical settings. The unexpected results in this dissertation, therefore, point to interesting and important topics for future research.

Finally, following Porter's (1980) conceptualization of strategy as a series of competitive moves taken by a firm as it strives for competitive advantages against others, the basic unit of analysis in this study is individual competitive moves. This micro approach is likely to reveal insightful information about how competitive advantage is created and sustained and how the structure of an industry evolves as a result of shifts in competitive methods that firms use. Moreover, this research captures the dynamics of multinational rivalry by studying the individual competitive action, a level at which "actual competitive engagement occurs, in which competitors enact their strategies, test

their opponents' mettle and capabilities, defend their reputations, and signal their toughness, via their actions and reactions" (Chen & MacMillan, 1992: 541).

Research Methodology

Consistent with previous research (Chen, 1988; Ferrier et al., 1999; Smith et al., 1992; Young et al., 1996), this dissertation employs a direct approach using structured content analysis of archival data to identify competitive actions of multinational firms in different national markets. This approach significantly contrasts with many competition studies in which competition is inferred indirectly from either cross-sectional survey data or year end financial data. Thus, the results yielded in this dissertation should be more applicable to practicing managers and more replicable in other settings.

Moreover, as a "technique for making inferences by objectively and systematically identifying specified characteristics of messages" (Hosti, 1969: 14), content analysis has been widely used by social scientists to examine a variety of research topics. Riffe, Lacy and Fico (1998) argued that content analysis is especially useful under the following conditions: 1) when it is difficult to access data; 2) when a researcher is limited to archival evidence; 3) when the volume of data surpasses the investigator's ability to conduct research. Although content analysis—as a powerful and effective research approach—has already attracted attention from a small group of scholars in strategic management, overall the exploration of the application of this research method has remained limited. Therefore, the approach this dissertation employed to collect data might be useful for scholars interested in doing content analysis on other research topics.

Practical Implications

The present study reinforces the notion of competitor analysis whereby a manager must know, understand and predict the competitive moves and responses of rivals (Porter, 1980). Nowadays, more and more firms do business internationally. Given the increasing price that these firms have to pay to play in global competition, the theoretical framework and empirical findings of this dissertation might be valuable for multinational managers in the following two aspects. First, managers can use the basic approach of the present study to develop a sound understanding of their own resources and capabilities, in contrast to their rivals, for engaging in global competition across national markets. Second, the present study might help managers develop predictions about their competitors' likely movements in diverse national markets and therefore increase their readiness to initiate aggressive actions or respond to threats swiftly.

LIMITATIONS

There are five main limitations of this dissertation. First, because the findings of the present study are based on firms in a single industry over a 7-year period, it is possible that the results reflect some factors specific to the industry, geographic region, or period under study. Future replications of this study in other settings are needed to address this possibility.

Second, the present study focuses only on those competitive actions which can be traced and identified using structured content analysis. As discussed in Chapter V, I deemed *Automotive News* a reliable source for studying competitive actions of global automakers. Nevertheless, and despite the extensive checks I made, *Automotive News* may

miss very subtle actions or consider some subtle actions not important enough to report. Moreover, this research investigates only the characteristics of competitive actions which can be inferred from *Automotive News*. The advantage of this emphasis on a single secondary source is its objectivity and replicability. However, this objective might have been achieved at the expense of some other equally important but difficult-to-measure characteristics, such as radicality, credibility and imitability.

Third, although this study provides evidence that important organizational and environmental characteristics influence an MNE's competitive behavior in predictable ways, the performance consequence of multinational firms' competitive actions remains untested. Do firms engaging in more competitive actions across countries achieve greater success and enhance their survival prospects? How will a firm's past performance affect its willingness and capability to compete? Answers to these questions certainly will help specify more fully why multinational firms compete differently in the marketplace and how their competitive behavior can shape strategic superiority and industry evolution.

Fourth, although I found substantial support for most of my hypotheses, I have no way of knowing the specific intent behind any action studied in this research. Subsequent research could adopt the "social construction of rivalry" view (Porac & Thomas, 1990) as a means of identifying a firm's intended rival and examining the intended effects of competitive action by including subjective measures of the competitive importance or magnitude of different kinds of actions.

Finally, the use of single measures for all the variables is another limitation of this research. For instance, the present study uses the total number of different types of actions

undertaken by a firm to measure its action complexity. In fact, many alternative measures

for the same construct can be found in the literature. Miller and Chen (1996) used three

related indexes to measure competitive simplicity: a range or "R" index (the one I used in

this study), a concentration or "C" index which assesses a firm's emphasis on those most

commonly employed types of actions, and a dominance or "D" index which assesses a

firm's emphasis on one single most common type of action. Although the data to construct

many of the alternative measures for the variables included in my study are not available

at this time, it will be worthwhile for future scholars to consider these measures when they

conduct similar research on global competition.

FUTURE RESEARCH DIRECTIONS

This dissertation offers several directions for future research. First, the present

study examines how subsidiary control, MNE size, national culture, government

regulation and multimarket contact influence an MNE's competitive aggressiveness. A

fruitful extension of the theoretical model developed in Chapter III is to explore the impact

of other factors on multinational rivalry. For example, numerous studies have shown that

the demographic characteristics of top management teams (TMTs) might greatly

influence a variety of organizational outcomes (Cannella & Hambrick, 1993; Hambrick,

Cho, & Chen, 1996; Hambrick & Mason, 1984). Researchers have found that TMT

international experience is a significant predictor of multinational firms' choice of entry

(Agarwal & Ramaswami, 1992; Delios & Beamish, 1999) and chances of survival in a

foreign market (Li, 1995; Steensma & Lyles, 2000). Generally, managers with more

international experience tend to have less difficulty integrating in the local culture and

developing capabilities more suited to the host environment (Delios & Henisz, 2000). As a result, they will be more capable and willing to undertake aggressive competitive actions against their rivals.

In addition to TMT international experience, the type of global strategy that an MNE chooses to pursue is also likely to affect its competitive behavior. From a strategic point of view, multinational firms differ in terms of the degree to which their strategies are globally integrated (Doz & Prahalad, 1984). In an MNE adopting a truly "global" strategy, subsidiaries act collectively; they do not independently maintain control over the environment. As a result, the common or shared competitive strategy of the whole MNE overwhelms the strategy of an individual subsidiary (Birkinshaw, Morrison, & Hulland, 1995). By contrast, in an MNE adopting a multidomestic strategy, each subsidiary formulates and implements its own strategy. Because of the desire to increase national responsiveness, there is no pressure on subsidiaries to make coordinated efforts in competing collectively across countries.

Considering the significant role that TMT international experience and MNE global strategy play in multinational rivalry, it is important for future scholars to investigate how other contingency variables might affect the competitive actions of MNEs across countries.

Furthermore there remains a great opportunity for future research to explore the influence of non-market strategy on multinational rivalry. To a multinational firm operating in diverse country markets, the environment of competition consists of two interrelated components: "the market environment, which includes activities that are

governed by markets or private agreements, and the nonmarket environment, which is characterized by the social, political and legal arrangements that structure firm interactions outside of, but in conjunction with markets" (Baron, 1997). Consistent with previous literature, non-market strategy refers to those activities that firms undertake to create a competitive environment which favors their competitive position. Non-market strategy can take various forms such as lobbying for government trade protection, developing interpersonal relationships with local officials, or being socially responsive in the foreign country market.

As noted by Henisz and Delios (2001), both market strategy and non-market strategy can affect multinational firms' competitive behaviors. In fact, as a source of efficiency, market power and legitimacy, the use of non-market strategy is critical for MNEs operating in a global context, in which political arbitrage and leverage opportunities are variegated and abundant. Therefore, to have a more complete understanding of competitive actions of multinationals, it is worthwhile for researchers to examine the determinants of MNE non-market strategy and its implications on multinational rivalry.

Third, considering the scope of this research, I do not examine how the cooperative relationship between rivals affects their competitive interaction. Like human actions, a firm's actions and strategies are rarely composed of a single characteristic. In practice, companies often compete and cooperate simultaneously with the same firms. As an under explored area, the antecedents and consequences of cooperative-competitive relationships between firms have attracted increasing attention from a small group of

scholars. For instance, taking a game theoretic approach, Brandenburger and Nalebuff (1996) showed how two players can use both competitive and cooperative means to influence their relative values with respect to shared customers and suppliers. Lado, Boyd and Hanlon (1997) argued that the combination of competitive and cooperative strategies creates a higher overall rent for a firm, which they call syncretic rent.

In fact in the automotive industry, various types of cooperative relationships can be frequently found between competing firms. For instance, General Motors, Chrysler and Ford are tit-for-tat competitors in a number of markets. They however cooperated closely on a project to design a new medium-sized sedan for the 2005 model year. Moreover, Toyota and General Motors invested intensively to co-develop radar cruise control. Finally, in the equity alliance between Renault and Nissan, the French automaker bought 37% of Nissan's equity. As note by Hiroyuki Yoshino, the president of Honda Motor Co. "the (global automotive) industry is becoming one big inbred family, everybody is talking to everybody about everything" (*Automotive News*, Nov 11, 1999).

Given the co-existence of cooperative and competitive relationships between multinational firms, many promising research questions can be posed for future research: "what kinds of competitive (or cooperative) actions are likely to elicit cooperative (or competitive) responses? What industry and organizational factors would explain the variability of competition-cooperation between firms? How would a firm manage the balance of competition-cooperation against a given rival?

In summary, the present study builds on diverse literatures to develop a framework for understanding multinational rivalry. As noted by Chen and Stucker (1997), global

competition is a dynamic phenomenon that occurs in a multinational context which is much more complicated than a domestic setting. Most existing competition research has not taken into account the important differences between domestic and global competition. I introduce an integrated model that explains the competitive behavior of MNEs at the firm level. In presenting this framework as a first step in a new direction, the present study hopes to improve our understanding of the factors that shape an MNE's competitive aggressiveness across national markets. The empirical findings of this dissertation also offer intriguing directions for future research.

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APPENDIX A

TABLE 2.1
Key Concepts in Game Theory

Concept	Description
Non-cooperative Game	Non-cooperative game analyzes situations in which players' payoffs depend on the actions of other players and in which the players cannot, in principle, sign binding agreements enforceable by third parties about what course of action to follow.
Nash Equilibrium (NE)	Nash Equilibrium: A profile of strategies such that given the other players conform to the (hypothesized) equilibrium strategies, no player has an incentive to unilaterally deviate from his (hypothesized) equilibrium strategy. The self-reference in this definition can be made more explicit by saying that a Nash equilibrium is a profile of strategies that form 'best responses' to one another, or a profile of strategies which are 'optimal reactions' to 'optimal reactions'.
Sub-game-Perfect Equilibrium (SPE)	Subgame perfect equilibrium: In extensive-form games with complete information, many strategy profiles that form best responses to one another imply incredible threats or promises that a player actually does not want to carry out anymore once he must face an (unexpected) off-equilibrium move of an opponent. If the profile of strategies is such that no player wants to amend his strategy whatever decision node can be reached during the play of the game, an equilibrium profile of strategies is called subgame perfect. In this sense, a subgame-perfect strategy profile is 'time consistent' in that it remains an equilibrium in whatever truncation of the original game (subgame) the players may find themselves.
Bayesian Nash Equilibrium (BNE)	Bayes-Nash equilibrium: In normal form games of incomplete information, the players have no possibility to update their prior beliefs about their types. All that a player knows, except from the game itself (and the priors), is his own type, and the fact that the other players do not know his own type as well. As their best responses, however, depend on the players' actual types, a player must see himself through his opponents' eyes and plan an optimal reaction against the possible strategies of his opponents for each potential type of his own. Thus, a strategy in a Bayesian game of incomplete information must map each possible type of each player into a plan of actions. Then, since the other players' types are unknown, each player forms a best response against the expected strategy of each opponent, where he averages over the (well-specified) reactions of all possible types of an opponent, using his prior probability measure on the type space. Such a profile of type-dependent strategies which are unilaterally unimprovable in expectations over the competing types' strategies forms a Bayes Nash equilibrium. Basically, a Bayes Nash equilibrium is thus a Nash equilibrium 'at the interim stage' where each player selects a best response against the average best responses of the competing players.
Perfect Bayesian Nash Equilibrium (PE)	Perfect Bayesian Nash equilibrium: Parallel to the extension of Nash equilibrium to subgame perfect equilibrium in games of complete information, the concept of Bayesian Nash equilibrium loses much of its bite in extensive form games and is accordingly refined to 'Perfect Bayesian' equilibrium. In a sequential game, it is often the threats about certain reactions 'off the equilibrium path' that force the players' actions to be best responses to one another 'onto the equilibrium path'. In sequential games with incomplete information, where the players hold beliefs about their opponents' types and optimize given their beliefs, a player then effectively 'threatens by the beliefs' he holds about his opponents' types after moves that deviate from the equilibrium path. Different beliefs about other players' types after deviations typically yield different reactions, some of which force the players back on the (candidate) equilibrium path, some of which lead them even farer away. In the first case, the plans of actions are confirmed by the beliefs about them, and the crucial self-confirming property of equilibrium beliefs and equilibrium strategies is met. The concept of Perfect Bayesian equilibrium makes precise this self-confirming 'interaction' of beliefs about types selecting certain actions and their 'actual' strategies. First, it requires that players forms a complete system of beliefs about the opponents' types at each decision node that can be reached. Next, this system of beliefs is updated according to Bayes' rule whenever possible (in particular, 'along the equilibrium path'), and finally, given each player's system of beliefs, the strategies from best responses to one another in the sense of ordinary Bayesian Nash equilibrium.
Sequential Equilibrium (SE)	Sequential equilibrium: Kind of refinement of Perfect Bayesian Equilibrium that puts sharper requirements on the beliefs which cannot be formed by Bayes' rule, but which are hold after moves off the equilibrium path. These beliefs have to be formed in a 'continuous' way from the information available in the extensive form of the game. Further refinements of Perfect Bayesian equilibrium restrict the players' beliefs about moves off the equilibrium path to the set of those types only for which the observed off-equilibrium move could have been worthwhile at all.

TABLE 2.2
Overview of Research on Competitive Dynamics

Reference	Focus	Main Propositions	Data and Sample	Method	Major Findings
MacMillan, Macaffery & Vanwijk (1985)	Response time of competitors	Using Allison (1971)'s three decision-making perspective, they suggest that six characteristics of a new product will affect the response time of the competitor: visibility, Perceived potential, strategic attack, radicality, and complexity and organization misfit.	The response lags of two large money center banks to new product introductions by a third large bank operating in the same geographical region in the period of 65-80 were reviewed.	Field interviews	The response time is strongly associated with most of the independent variables, in particular with "visibility". The weakest association is found with "perceived potential".
Bettis & Weeks (1987)	The impact of strategic interactions on financial returns	Shareholder returns and changes in market risk are associated with both overall strategies and specific competitive move.	Competition between Kodak and Polaroid n instant photography is used as an example.	Financial event study	Shareholder wealth changes can be associated with particular competitive moves and firm overall strategy. Information disclosure and manipulation as elements of strategy can have significant impact on market returns in an industry
Smith & Grimm & Gannon & Chen (1991)	Predicting competitive responses and linking variations in response to performance	The paper identifies four attributes of response—imitation, likelihood, lag, and order—explaining them in terms of 1) the signal, or information represented, in the type of action and 2) the information-processing characteristics and capabilities of the responding firm.	U.S. Airline industry	Structured content analysis and OLS regression	Findings support the notion that a firm's response can be predicted from the manner in which it interprets and processes information. Further, three of the four response characteristics are related to performance (except for response imitation).
Smith, Grimm & Gannon (1992)	A communication-Information model	Predict response using reputation characteristics of actor Analyze the nature of actions and the manner in which these actions can be used to predict response Predict response using the characteristics of responder Emphasize the role of competitive environment in strategy and competitive advantage. Examine performance consequence of acting and responding	The electrical manufacturing and high technology industry Airline industry Computer retailing industry	Case study, Survey, questionnaire and Structured content analysis	Firm reputation plays an important role in determining the way a rival will respond The underlying characteristics of an action can be important predictors of competitive response The information capacity and analyzing mechanisms of a firm can affect its response Differences in rivalry across industries are a function of the amount and quality of competitive information available. Holding time constant, early movers do better, holding order of response constant, slow movers do better.

TABLE 2.2
(Continued)

Reference	Focus	Main Propositions	Data and Sample	Method	Major Findings
Chen, Smith & Grimm (1992)	Action characteristics as predictors of competitive responses	Competitive responses can be predicted by four characteristics of the initial actions: competitive impact, attack intensity, implementation requirement and type of action	US Airline Industry	Structured content analysis and OLS regression	Competitive impact and attack intensity are positively related with the number of responses. Strategic action and substantial implementation requirement reduce the number and delay the timing the rivals counteraction. Competitors with a high stake in market react slowly
Chen & MacMillan (1992)	Predicting Non-response and delayed response	The likelihood of non-response, response delay and a response will match an initial move can be explained by two variables: competitor dependence on the market being attacked and irreversibility of the action	US Airline industry	Structured content analysis and OLS regression	Competitor dependence depresses chances of non-response and increases response delay and the likelihood of a match retaliation. Action irreversibility has the opposite effect. Attacker and early responder gain market share at the expense of late and non responder.
Chen & Miller (1994)	The linkage between action characteristics and retaliation	Low visibility, substantial response difficulty, or minimal centrality would each by itself be enough to prevent retaliation.	US Airline industry	Structured content analysis and OLS regression	Subtle attacks would provoke fewer responses than more visible, more central and more easily imitated actions. Interaction effects: low levels of difficulty and high levels of visibility are especially likely to elicit retaliation.
Chen & Hambrick (1995)	How small firms differ from large firms in competitive behavior	Small firms and big firms are different in two important attributes of competitive actions: propensity for action and action execution speed. They also differ in terms of responsiveness, response announcement speed, and response execution speed.	US Airline industry	Structured content analysis and MANOVA	The small firms more actively initiated competitive challenges and were speedy, but low-key, even secretive, in executing their actions. They were also less likely and slower to respond when attacked, and, their responses were more visible than those of their larger opponents. Deviations from group norms hurt performance for both the large and small firms.

TABLE 2.2
(Continued)

Reference	Focus	Main Propositions	Data and Sample	Method	Major Findings
Miller & Chen (1996)	The simplicity of competitive repertoires	Competitive simplicity is largely a function of organizational and environmental properties that attenuate managerial search or restrict knowledge of competitive alternatives. These properties include good performance, munificent, homogeneous or certain markets, a lack of breadth in competitive experiences, and the complacency associated with size and age.	US Airline Industry	Structured content analysis and panel data analysis	Past performance is positively related with competitive simplicity; broad competitive experience, market diversity are negatively related with competitive simplicity. Simplicity can hurt subsequent performance, especially during periods of uncertainty and growth.
Chen (1996)	Structure context before an attack	Market commonality and resource similarity each makes a firm less likely to initiate an attack and more likely to respond to an attack. Competitive asymmetry: a given pair of firms may not pose an equal threat to each other.			
Young, Smith & Grimm (1996)	Firm level competitive activity and performance	Industry level cooperative mechanisms decrease firm level competitive activity. Firm level cooperative mechanisms increase firm level competitive activity. Industry level competition reduces firm level performance, whereas firm level competition increases performance	US computer software industry	Structured content analysis and OLS regression	Engaging in firm level cooperative mechanisms has a positive effect on the firm's competitive activity and that competitive firm activity is related positively to firm performance. Industry level cooperative mechanisms are not related to the firm's competitive activity or to its performance
Ferrier, Smith & Grimm (1999)	Competitive action & market share erosion & industry dethronement	Dethronement and market share erosion are a function of the competitive behaviors or actions of industries' market share leaders and their respective number two challengers.	Seven-year cross section of the two largest single business firms in 41 industries	Structured content analysis and GLS regression	Leaders are more likely to experience market share erosion and/or dethronement when—relative to industry challengers—they are less competitively aggressive, carry out simpler repertoires of actions, and carry out competitive actions more slowly.
Ferrier (2001)	Characteristics of firms' sequence of actions and firm performance	Characteristics of firms' sequence of competitive actions account for differences in their relative performance. A firm's sequence of actions is influenced by important organizational and environmental characteristics	Seven-year cross section of the two largest single business firms in 16 industries	Structured content analysis and panel data analysis	Relative performance is linked to sustaining a high level of competitive aggressiveness. A firm's competitive aggressiveness can be explained by TMT heterogeneity, past performance, slack and three important industry characteristics.

TABLE 2.3

Overview of Current Research on Multimarket Competition in Strategic Management

Reference	Dependent Variable & Focus	Main Propositions	Data and Sample	Major Findings
Baum & Korn (1996)	Rates of entry and exit. Focus on market domain and MMC.	Market domain overlap is positively associated with competition intensity, while multimarket contact is negatively related to competitive aggressiveness. The impact of multimarket contact is dependent on 1) the extent to which firms dominate particular markets and 2) the degree of concentration in a firm's markets.	California Commuter Airline from 1979-1984.	The greater the degree of market domain overlap a firm is exposed to, the higher its market entry and exit rates. There is an inverted U-shape relationship between the market density and entry rate. firms have lower entry and exit rates for markets on which they have high MMC with incumbents. MMC effects are strongest when a market is clearly dominated by a single a firm.
Singal (1996)	Pricing behavior of firms around mergers		Airline mergers during 1985-1988	Mergers in airline markets cause prices to rise due to an increase in MMC. A change in MMC has impact on prices independent of concentration changes. Increases in both MMC and concentration generate much greater price effects than an increase in either MMC or concentration.
Parker & Roller (1997)	Collusion in firms' pricing behavior. Focus: regulatory factor, cross ownership and MMC	Limited entry regulatory policies, and in particular the duopolistic regulatory system, multimarket contact and cross-ownership lead to collusive conduct and therefore high prices.	US cellular telephone industry from 1984 to 1988.	The duopolistic industry structure appears to be more collusive than a non-cooperative duopoly. Regulation might lead to high prices but its effect is nonlinear. Cross-ownership and MMC are important factors in explaining non-competitive prices.
Boeker, Goodstein, Stephan & Murmann (1997)	Market exit. Focus: MMC, entry mode of product or service offering and CEO change	Organizations with high MMC with competitors in a particular market are less likely to exit. Organizations entering a market through contracting are more likely to exit. Organizations with a new CEO are more likely to exit. Poorly performing firms are more likely to exit.	286 California hospitals from 1980 to 1986	Hospitals are less likely to exit markets in which they meet large numbers of their MM rivals. Contracting firms and firms with a new CEO are more likely to exit markets.

TABLE 2.3
(Continued)

Reference	Dependent Variable & Focus	Main Propositions	Data and Sample	Major Findings
Jayachandran, Gimeno & Varadarajan (1999)	Theoretical piece	The negative relationship between the degree of multimarket contact and the intensity of competition will be stronger in conditions of 1) sphere of influence 2) firms having organizational structure characterized by a greater degree of coordination of actions 3) high resource similarity 4) moderate seller concentration		
Baum & Korn (1999)	Market entry and exit Focus: MMC and size	A firm's rate of entry (exit from) into a competitor's market is related in an inverted U-shaped manner to the level of MMC with the competitor. The deterrence effect of MMC on a firm's rate of entry (exit from) into a rival's market is positively related with the rival's size	California Commuter air carriers from 1979 to 1984	There is an inverted U shaped relationship between firms' rate of entry into and exit from each other's markets and the level of MMC in competitor dyads. Size asymmetries in competitor relationships discourage the emergence of forbearing behavior, but only in terms of entry.
Gimeno & Woo (1999)	Efficiency/ intensity of rivalry/profitability Focus: resource sharing opportunity and MMC	Efficiency is influenced by a firm's scope economies, but the intensity of rivalry is determined by MMC with rivals and their scope economies. The confluence of strong scope economies with MMC results in superior economic performance.	US airline industry from 1984 to 1988	MMCs are more likely to occur in markets with strong resource-sharing opportunities. Evidences support the link between scope economy, MMC and profitability but strong scope economies may not result in high performance if rivals can obtain similar economies in non-overlapping markets.
Gimeno (1999)	Competitive intensity Focus: Sphere of Influence	Asymmetry in territorial interests provides multimarket competitors with footholds in important markets of their rivals, which can be used to deter the behavior of the rivals in other markets.	US Airline industry from 1984 to 1988	Airlines use footholds in their rivals' important markets (particularly in their hubs) to reduce the competitive intensity of those rivals in the airline's own important markets (their hubs), and sustain their dominant positions (or sphere of influence) in those markets.

TABLE 2.3
(Continued)

Reference	Dependent Variable & Focus	Main Propositions	Data and Sample	Major Findings
Korn & Baum (1999)	The antecedence of multimarket contact	Three distinct causal factors that might affect the likelihood that multimarket relationships will develop: 1) chance, 2) trait-based imitation unrelated to multimarket contact and 3) strategic choice reflected in vicarious learning, experiential learning, and selective search related to multimarket contact.	California commuter airlines from 1979 through 1984	Multimarket contact arises from chance market contacts among competitors pursuing uncoordinated strategies, trait-based imitation unrelated to multimarket contact, vicarious learning related to multimarket contact, and strategic attempts to develop multimarket contact based on insight gained through experiential learning.
Greve (2000)	Market niche entry decision	The choice of location is determined by 1)density dependence 2) mimetic isomorphism 3) decision-making momentum 4) mutual forbearance.	Japanese banks in Tokyo from 1894 to 1936	Density of branches showed predicted inverted-U shaped relation with the location choice. The decision of large firms was imitated. Past location decisions were repeated. Banks established an additional point of contact with single-point competitors, not with multi-point competitors.
Korn & Rock (2001)	Why and how firms navigate the transition from MMC to mutual forbearance	The paper differentiates between the creation and exploitation of MMC. The paper examines specific factors that influence the likelihood that a firm will seek to develop a purposive set of MMC with specific competitors, as opposed to developing naïve contacts based on an internally derived logic. The paper suggests that competitor identification, organization structure, ease of competitive response and industry structure all play important roles in determining the ability of managers to seek MMC.	Theoretical piece	

TABLE 5.1
World Motor Vehicle Production in 2000
(Units in Thousands)

Manufacturer	Total
GM	8,114
Ford	7,206
Toyota	5,897
Volkswagen	5,106
DaimlerChrysler AG	4,666
PSA Peugeot-Citroen	2,879
Nissan	2,698
Fiat	2,639
Renault	2,515
Hyundai	2,488
Honda	2,469
Mitsubishi	1,613
Suzuki	1,434
World	56,431

TABLE 6.1
Dataset 1- Variable Means, Standard Deviations and Correlation Coefficients

Variable	Mean	Std	1	2	3	4	5	6	7	8	9	10	11	12
1. Action volume	1.88	3.50												
2. Action complexity	.59	.92	.82**											
3. Host government constraint	3.47	.63	.13**	.09**										
4. Home government protection	3.54	.42	.01	-.01	.24**									
5. Minority JV	.07	.25	-.07**	-.06*	-.26**	-.09**								
6. Majority JV	.14	.34	-.03	-.04**	-.10**	-.02	-.11**							
7. Cultural distance (Markets)	58.63	20.87	-.15**	-.09**	-.28**	-.10**	.14**	.17**						
8. Log MNE size	15.02	.59	.17**	.16**	-.12**	.42**	.01	.04	.08**					
9. GDP growth rate	3.16	3.27	-.07**	-.05†	.02	.01	.07**	.01	.07**	.04				
10. Exchange rate volatility	4.77	1.05	-.01	-.02	.50**	.14**	-.08**	.05†	-.20**	.01	.11**			
11. Culture openness	5.46	.62	-.04	-.08**	.07**	.09**	-.05†	.06*	-.07**	.02	.10**	.20**		
12. Log market size	13.81	1.33	.23**	.33**	-.06*	-.16**	-.03	-.08**	-.05†	-.11**	-.10**	-.27**	-.32**	
13. Log MNE age	4.23	0.39	.05*	.01	.03	.46**	-.14**	.01	.17**	.34**	.01	.08**	.10**	-.14**

N =1,491   † p<.10   *p<.05   **p<.01

Note: The basic unit of analysis of Dataset 1 is the firm-country market-year

TABLE 6.2

Dataset 2- Variable Means, Standard Deviations and Correlation Coefficients

Variable	Mean	Std	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Action volume	.22	.61													
2. Action complexity	.21	.54	.91**												
3. Host government constraint [a]	.00	1.00	.06**	.04**											
4. Home government protection	3.52	.42	.02†	.01	.22**										
5. Minority JV	.05	.21	-.03**	-.01	-.22**	-.07**									
6. Majority JV	.12	.32	.00	-.01	-.09**	-.01	-.08**								
7. Cultural distance (Markets)	56.65	20.32	-.07**	-.06**	-.24**	-.12**	.11**	.12**							
8. Cultural distance (Rivals) [a]	.00	1.00	-.10**	-.08**	-.04**	-.09**	.01	-.02*	.01						
9. Log MNE size	14.98	.58	.14**	.14**	-.12**	.43**	.04**	.01	.04**	-.04**					
10.GDP growth rate	2.95	2.84	-.02**	-.02*	.03**	.01	.06**	.01	.07**	-.01	.04**				
11.Exchange rate volatility	4.74	1.06	.01	.01	.51**	.11**	-.08**	.03**	-.19**	-.07**	.01	.11**			
12.Culture openness	5.41	.60	.01	-.01	.01	.08**	-.04**	.06**	-.02*	-.06**	.02**	.16**	.14**		
13.Log Market size	14.12	1.33	.07**	.08**	.01	-.15**	-.02*	-.06**	-.07**	.08**	-.12**	-.13**	-.21**	-.32**	
14.Log MNE age	4.22	0.40	.05**	.03**	-.01	.47**	-.11**	.02†	-.17**	-.10**	.33**	.01	.04**	.08**	-.13**
15.Local rival (0/1)	.07	.25	.08**	.09**	.01	-.03**	-.01	-.01†	.01	.11**	-.03**	-.06**	-.06**	-.25**	.31**

N = 12,508   † p<.10   * p<.05   ** p<.01

Note: The basic unit of analysis of Dataset 2 is the focal firm-competitor-country market-year
a Host government constraint and cultural distance between rivals were standardized with mean of 0 and standard deviation of 1 because of the use in interaction term.

TABLE 6.3

Dataset 3- Variable Means, Standard Deviations and Correlation Coefficients

Variable	Mean	Std	1	2	3	4	5
1. Action volume	3.32	6.72					
2. Action complexity	1.01	1.41	.72**				
3. Log MNE age	4.19	0.42	.15**	.10**			
4. Cultural distance (Rivals) [a]	.00	1.00	-.22**	-.25**	-.03		
5. Multimarket contact [a]	.00	1.00	.31**	.47**	.03	-.20**	
6. Log MNE size	14.86	.57	.32**	.39**	.32**	.02	.35***

N = 1,006   † p<.10   * p<.05   ** p<.01

Note: The basic unit of analysis of Dataset 3 is the focal firm-competitor-year
a multimarket contact and cultural distance between rivals were standardized with mean of 0 and standard deviation of 1
because of the use in interaction term.

TABLE 6.4

Distribution of Competitive Actions by Country

Country Name	Frequency	Percentage
Argentina	36	0.69
Austria	107	2.06
Belgium	99	1.91
Brazil	155	2.99
Canada	16	0.31
China	93	1.79
France	563	10.85
Germany	512	9.87
India	97	1.87
Indonesia	48	0.92
Ireland	88	1.7
Italy	503	9.7
Japan	315	6.07
Malaysia	47	0.92
Mexico	25	0.48
Netherlands	96	1.85
Norway	80	1.54
Philippines	30	0.58
Poland	161	3.1
Portugal	92	1.77
Russia	199	3.83
South Korea	45	0.87
Spain	410	7.9
Sweden	84	1.62
Switzerland	116	2.24
Thailand	96	1.85
UK	485	9.35
USA	590	11.37
Total	5188	100

TABLE 6.5
FGLS Results for Dataset 1: Determinants of Competitive Action Volume and Action Complexity

Variables	Action Volume		Action Complexity	
	Model 1	Model 2	Model 3	Model 4
Constant	-12.66***	-18.35***	-4.40***	-6.85***
Host government constraint	-.50***	-.80***	-.14***	-.19***
Home government protection	.81***	.85***	.24***	.22***
Minority JV	-.15	-.26†	-.07	-.05
Majority JV	-.09	-.06	-.04	-.01
Cultural distance (Markets)	-.38***	-.32***	-.09***	-.08***
Log MNE size	1.01***	.97***	.35***	.34***
GDP growth rate		-.02*		.01
Log MNE Age		.11†		.01
Exchange rate volatility		-.18***		-.03*
Culture openness		.11		.01
Log market size		.43***		.19***
Log-likelihood	-3108.05	-3128.56	-1445.80	-1409.73
χ2	148.94***	23.61***	12.30***	406.19***

N = 1491
† p<.10   * p<.05   ** p<.01   *** p<.001

TABLE 6.6
FGLS Results for Dataset 2: Determinants of Competitive Action Volume

Variables	Action Volume			
	Model 1	Model 2	Model 3	Model 4
Constant	-.94***	-1.24***	-1.24***	-1.29***
Cultural distance (Markets)	-.03***	-.03***	-.03***	-.02***
Cultural distance (Rivals)	-.03***	-.03***	-.03***	-.03***
Log MNE size	.08***	.08***	.08***	.09***
Minority JV	-.03**	-.06***	-.05***	-.04***
Majority JV	.02**	.01	.01*	.01
Host government constraint	-.01***	-.01***	-.01***	-.01***
Home government protection	.03***	.03***	.03***	.02***
GDP growth rate		.01***	.01***	.01***
Log MNE age		.01	.01	.01
Log market size		.01***	.01***	.01***
Exchange rate volatility		.01**	.01**	.01**
Culture openness		.01*	.01†	.01†
Local rival (0/1)		.22***	.23***	.17***
Cultural distance (Rivals) x host gov. constraint			.01	.01
Local rival x host gov. constraint				.01
Log	4852.57	4294.77	4276.91	4078.59
χ2	622.95***	80.50***	697.10***	659.78***

N = 12, 508
† p<.10   * p<.05   ** p<.01   *** p<.001

TABLE 6.7

FGLS Results for Dataset 2: Determinants of Competitive Action Complexity

Variables	Action Complexity			
	Model 1	Model 2	Model 3	Model 4
Constant	-.96***	-1.31***	-1.31***	-1.33***
Cultural distance (Markets)	-.03***	-.03***	-.03***	-.03***
Cultural distance (Rivals)	-.03***	-.03***	-.03***	-.03***
Log MNE size	.08***	.09***	.09***	.09***
Minority JV	-.01	-.03**	-.03**	-.03**
Majority JV	.02†	.01	.01†	.01
Host government constraint	-.01***	-.01***	-.01***	-.01***
Home government protection	.03***	.03***	.03***	.02***
GDP growth rate		.01***	.01***	.01***
Log MNE age		-.01***	-.01***	-.01***
Log market size		.02***	.02***	.02***
Exchange rate volatility		.01	.01	.01†
Culture openness		.01	.01	.01
Local rival (0/1)		.22***	.23***	.20***
Cultural distance (Rivals) x host gov. constraint			.01	.01
Local rival x host gov. constraint				.01
Log	4927.48	5136.43	5139.18	5042.34
χ2	593.63***	838.64***	809.47***	798.31***

N = 12,508

† P<.10   * P<.05   ** P<.01   *** P<.001

TABLE 6.8

FGLS Results for Dataset 3: Determinants of Competitive Action Volume and Action Complexity

Variables	Action Volume			Action Complexity		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	-28.53***	-24.90***	-21.08***	-9.88***	-8.55***	-7.87***
Cultural distance (Rivals)	-.90***	-.85***	1.00**	-.24***	-.22***	.55***
Log MNE size	1.97***	1.71***	1.44***	.66***	.58***	.52***
Multimarket contact	4.72***	4.60***	4.86***	2.75***	1.84***	2.32***
Log MNE Age		.31***	.43***		.01	.02
Multimarket contact x CD (Rivals)			-3.74***			-1.78***
Log Likelihood	-2372.99	-2138.51	-2153.35	-1127.05	-944.68	-918.86
$\chi 2$	305.24***	192.25***	146.33***	935.58***	46.82***	495.52***

N = 1,006

† p<.10   * p<.05   ** p<.01   *** p<.001

TABLE 6.9
Summary of the Results Regarding the Antecedents of Multinational Rivalry

Variable	Action Volume	Action Complexity
Subsidiary Control	+	+
MNE Size	+	+(-)
Cultural Distance between Rivals	-	-
Cultural Distance between Home and Host Markets	-	-
Host Government Constraint	-	-
Home Government Protection	+	+
Multimarket Contact	+(-)	+(-)
Cultural Distance between Rivals x Host Government Constraint		
Cultural Distance between Rivals x Multimarket Contact	-(+)	-(+)

The sign "+" indicates a positive relationship, and the sign "-" indicates a negative relationship.

FIGURE 2.1
An Action-and-Response Model
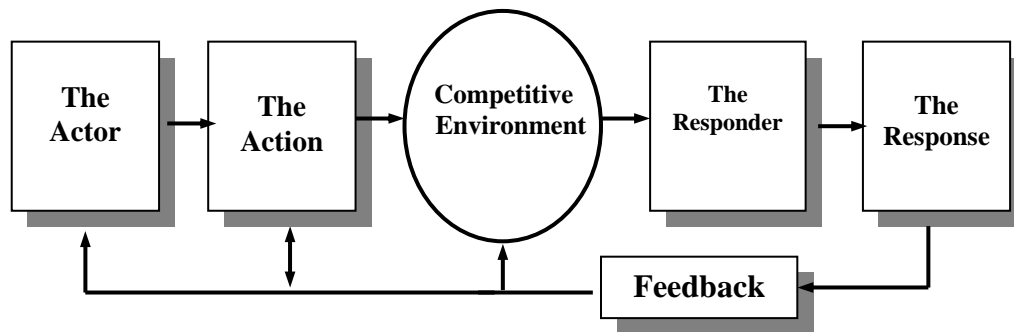
FIGURE 3.1
An Integrated Framework of Multinational Rivalry
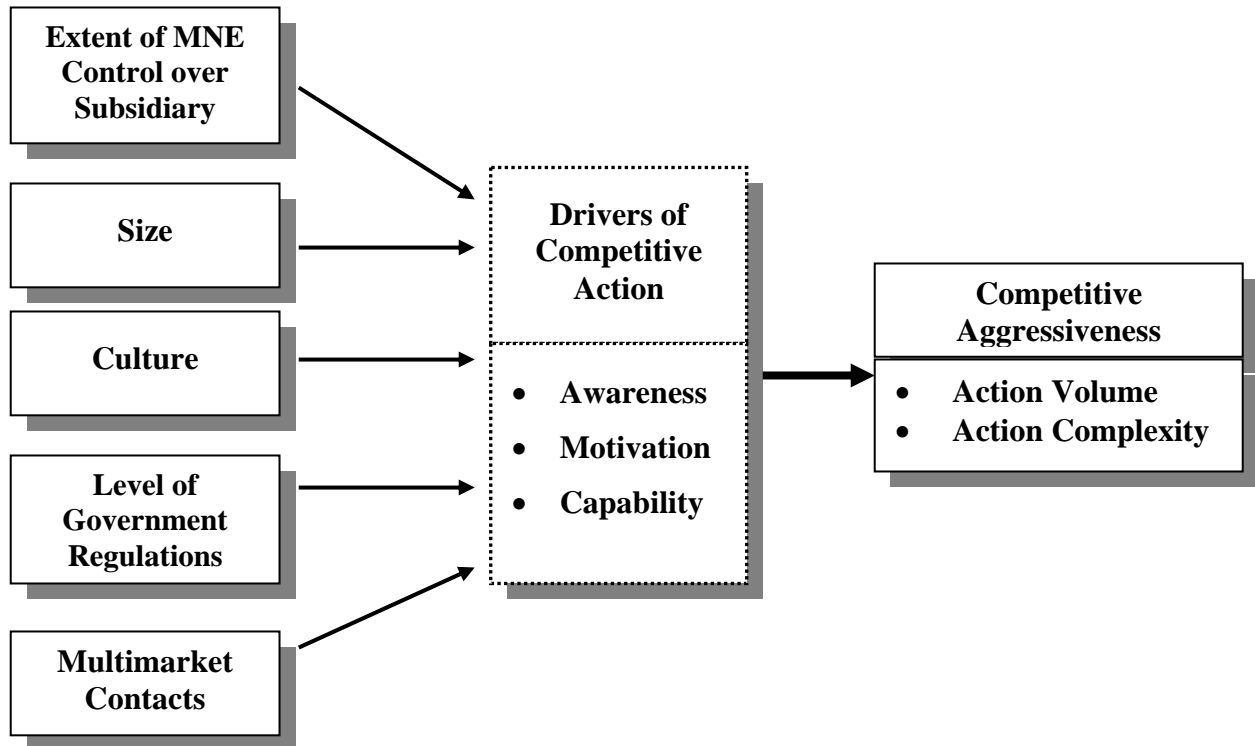
FIGURE 4.1
General Research Model of Multinational Rivalry
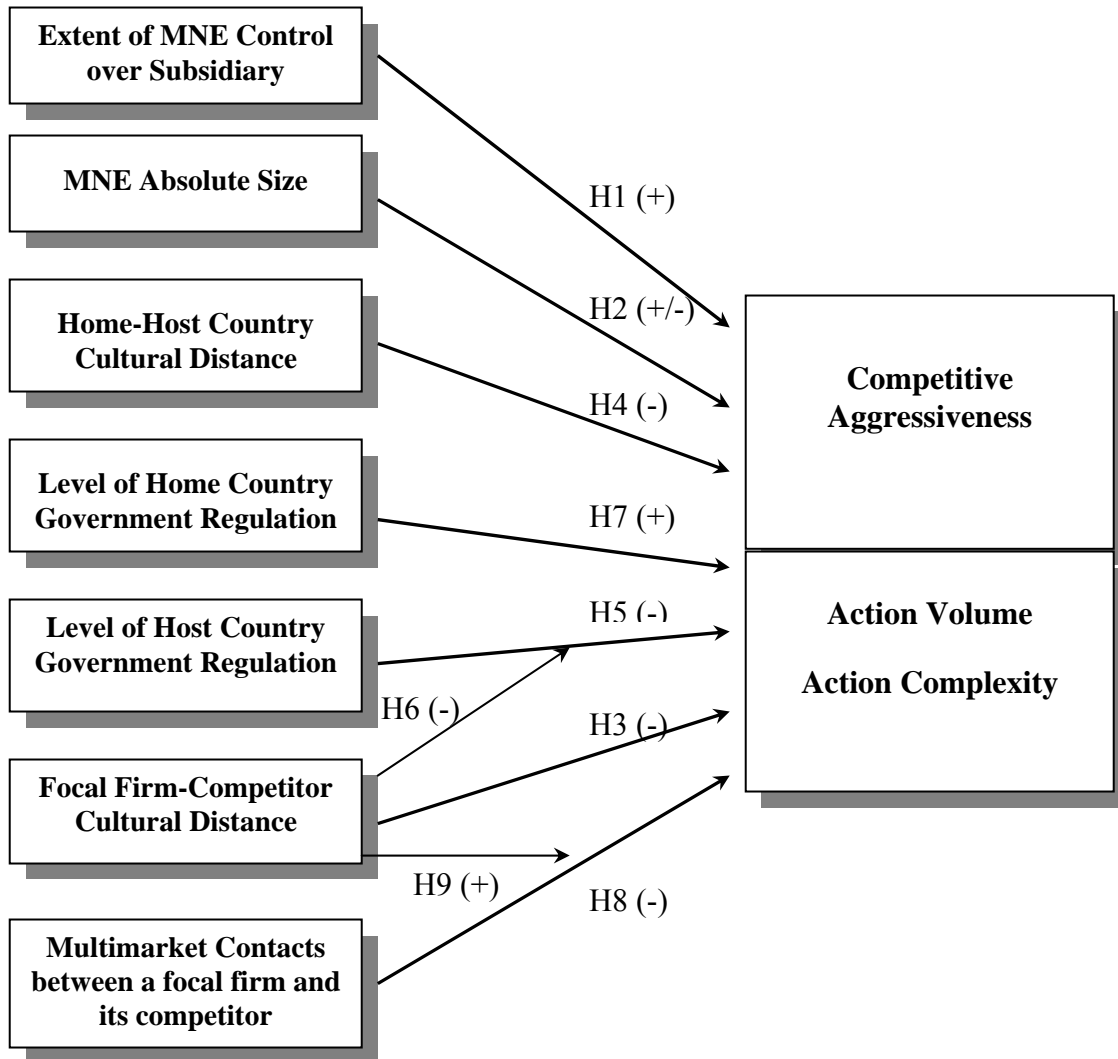
FIGURE 6.1
Distribution of Action Types in Dataset 2
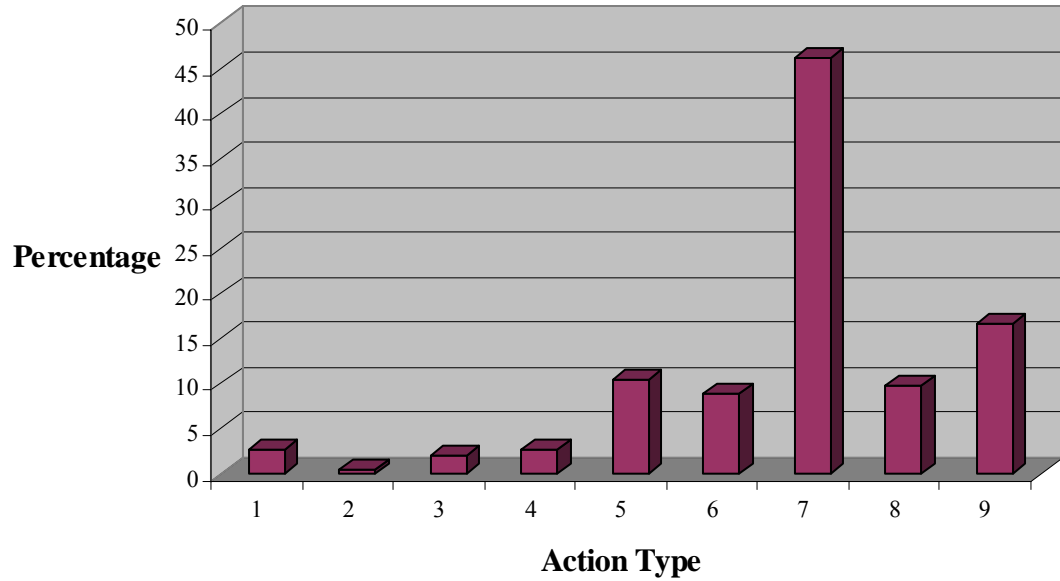
1. Capacity Action
2. Changes in Organizational structure and management systems
3. Improvement of distribution and after-sales service
4. Marketing action
5. Pricing action
6. Technology innovation
7. New product action
8. International expansion
9. Diversification

FIGURE 6.2
Distribution of Different Types of Subsidiary Control in Dataset 2
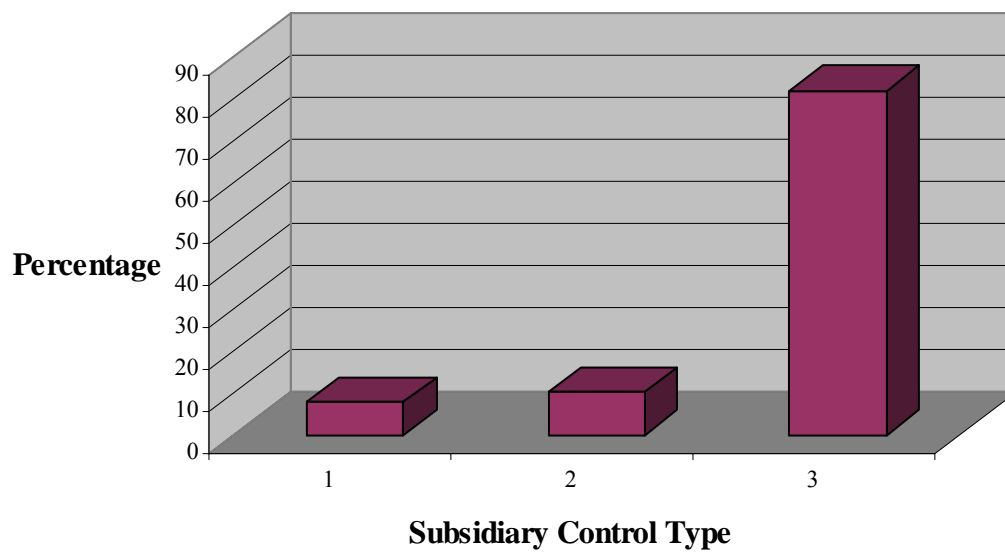
1. Minority joint venture
2. Majority joint venture
3. Wholly owned subsidiary

FIGURE 6.3
Distribution of Competitive Actions by Firm in Dataset 2
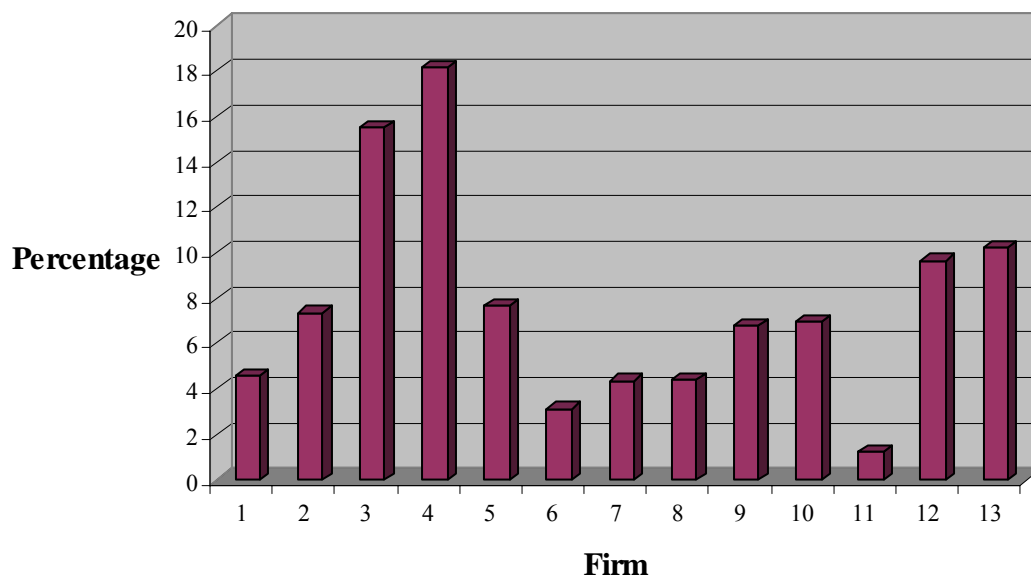
1. Daimler-Chrysler
2. Fiat
3. Ford
4. General Motors
5. Honda
6. Hyundai
7. Mitsubishi
8. Nissan
9. Peugeot
10. Renault
11. Suzuki
12. Toyota
13. Volkswagen

APPENDIX B

Summary List of Hypotheses and Corresponding Data Sets

Dataset	Hypothesis being tested	Unit of Analysis	Major Variables
1	H_{1a} & H_{1b}: strong subsidiary control increases action volume and action complexity H_{2a} & H_{2b}: size is positively related to action volume and negatively related to action complexity. H_{4a} & H_{4b}: cultural distance between the home and host markets decreases action volume and action complexity. H_{5a} & H_{5b}: Strong host government restriction decreases action volume and action complexity H_{7a} & H_{7b}: Home government restriction increases action volume and action complexity	Firm-Country Market-Year	**Dependent Variables** Action Volume: total number of competitive actions taken by a firm (initiator) across all its competitors (target) in a focal market every year Action Complexity: total types of actions taken by a firm (initiator) across all its competitors (target) in a focal market every year **Independent Variables** Subsidiary control Cultural distance between home and host markets Host government constraint Home government protection MNE size **Controls** Number of Subsidiaries MNE Age Market Size Growth rate of GDP GDP Exchange rate volatility Culture openness

Dataset	Hypothesis being tested	Unit of Analysis	Major Variables
2	H_{3a} & H_{3b}: cultural distance between rivals decreases action volume and action complexity. H_{6a} & H_{6b}: culturally similar rivals are MORE likely to reduce the action volume and action complexity when the host government restriction is strong.	Focal Firm-Competitor-Country Market-Year	**Dependent Variables** Action Volume: total number of competitive actions taken by a firm (initiator) against its rival (target) in a focal market every year. Action Complexity: total types of actions taken by a firm (initiator) against its rival (target) in a focal market every year. **Independent Variables** Cultural distance between rivals Host government constraint MNE Size Home government protection Subsidiary control Firm size Cultural distance between home and host markets **Controls** Number of Subsidiaries MNE Age Market Size Growth rate of GDP GDP Exchange rate volatility Culture openness

Dataset	Hypothesis being tested	Unit of Analysis	Major Variables
3	H_{8a} and H_{8b}: the number of multimarket contact between an initiator and a target is negatively related to the initiator's action volume and action complexity H_{9a} and H_{9b}: the competition reduction effect is weaker when the initiator and the target are from culturally similar countries	Focal firm-Competitor-Year	**Dependent Variables** Action Volume: total number of competitive actions taken by a firm (initiator) against its rival (target) across all markets every year. Action Complexity: total types of actions taken by a firm (initiator) against its rival (target) across all market every year. **Independent Variables** Cultural distance between rivals Multimarket contact MNE size **Controls** Number of Subsidiaries MNE Age

APPENDIX C

List of Key Words/Phrases for Searching Competitive Actions

Key Words/Phrases

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against
aggressively
ahead of   put pressure
aimed directly at   race
assault   rekindle
attack   respond
battle   response
beat   retreat
break up   rival
catch up with   score
challenge   snatch
compet   steal
contest   stronghold
counter   struggle
craze   stung
defend   surpass
domin   take action
eat away   take on leadership
enhance   target
escalate   threaten
fend off   top
fiercely   triumph over
fight   under assault
head to head   under siege
head-to-head   under the pressure of
heat up   war
in face of
initiative
intensify
invade
keep pace with
lead over
neck and neck
No.1
outperform
outstrip
pull ahead

APPENDIX D

Descriptions and Examples of Competitive Action Types

Action Type	Description	Example
Pricing Action	Price-related actions such as price cut, rebate and discount	Ford offered pickup owners a $500 discount coupon to buy a 1999 Ford F-150 or F-250 or a 2000 F-150
New product action	Product redesign, new model introduction and new product development	Honda launched the Insight, a gasoline-electronic two-seat coupe in Europe
Marketing action	Marketing related actions such as marketing campaign, advertisement investment, innovation on marketing method and brand management	GM Launched a Hispanic-targeted marketing campaign in California
Technology innovation	Product and process innovation	Peugeot and Ford spent $1billion to design V-6 and V-8 direct-injection common-rail diesel engines
Capacity action	Changes in a company's capacity or output	Toyota decided to add a second vehicle, the Verso microvan, to the new factory in Valenciennes, France.
Improvement in distribution and after sales service	Changes in a company's distribution systems and after sales services	Chrysler mounted an ambitious push to set up its dealer network outside Bangkok
Diversification	Diversification into other market segment	Toyota decided to go after the Big 3's bread and butter by entering full-sized pickup segment in 1995model year
International expansion	Expansion into new country markets	Ford and Chrysler won Vietnamese government approval to set up joint venture in Vietnam
Changes in organizational structure and management systems	Changes in organizational structure and management systems	GM decided to downplay its traditional reliance on competitive bidding and made efforts to form long-term bonds with suppliers like Magna

APPENDIX E

List of Countries Used in This Study

Country Name	Region
Argentina	South America
Austria	Western Europe
Belgium	Western Europe
Brazil	South America
Canada	North America
China	Southern and Eastern Asia
France	Western Europe
Germany	Western Europe
India	Southern and Eastern Asia
Indonesia	Southern and Eastern Asia
Ireland	Western Europe
Italy	Western Europe
Japan	Southern and Eastern Asia
Malaysia	Southern and Eastern Asia
Mexico	North America
Netherlands	Western Europe
Norway	Western Europe
Philippines	Southern and Eastern Asia
Poland	Eastern Europe
Portugal	Western Europe
Russia	Eastern Europe
Korea	Southern and Eastern Asia
Spain	Western Europe
Sweden	Western Europe
Switzerland	Western Europe
Thailand	Southern and Eastern Asia
UK	Western Europe
USA	North America

APPENDIX F

Competitive Exchanges Between Sample Firms

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-------------------------------------------------------------------------------------
Chrysler - Fiat     Fiat - Chrysler
-------------------------------------------------------------------------------------
          1995         1996         1997         1998         1999         2000         2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
CH FI                             *



FI CH                                                             *  *
-------------------------------------------------------------------------------------
Chrysler - Ford     Ford - Chrysler
-------------------------------------------------------------------------------------
          1995         1996         1997         1998         1999         2000         2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
CH FO *    ** *** * * ** ** ****         **      * **      *      *    *    *      * * * **
             *        **       *              * *        *      *      *      *
                                                                  *

                         *                                  *
                   *          * *              **         * * *       *              *
FO CH    *   **  ** **    * * *       *      ****       * * *    *** ** **    ** **
-------------------------------------------------------------------------------------
Chrysler - General Motors    General Motors - Chrysler
-------------------------------------------------------------------------------------
          1995         1996         1997         1998         1999         2000         2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
CH GM  *  * * *    *  * ** **** * * * *  *  *****    ** *   **        *    *    *** *
       *       *       *      * *         * *      ** *                          *
                                                  *
                                    *         * *
       * *                 *         * * * **  * *    *  **
GM CH  * *       * *****    **  * * *   * ** ** *** ****   *****    *    ** * * *    ** *
-------------------------------------------------------------------------------------
Chrysler - Honda     Honda - Chrysler
-------------------------------------------------------------------------------------
          1995         1996         1997         1998         1999         2000         2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
CH HO    *       * *    **      *         * *      * *           *      *      * *  * *
         *         *          *                                 *
                                                               *

                                                          *
         *                                                *  *
HO CH    *       *       *       *         *         *     ** *              *
-------------------------------------------------------------------------------------
```

```
Chrysler - Hyundai      Hyundai - Chrysler
-----------------------------------------------------------------------------------------
          1995         1996         1997         1998         1999         2000         2001
      JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
CH HY




HY CH                                                                        *
-----------------------------------------------------------------------------------------
Chrysler - Mitsubishi      Mitsubishi - Chrysler
-----------------------------------------------------------------------------------------
          1995         1996         1997         1998         1999         2000         2001
      JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
CH MI     *                                                 *
          *



                                                  *
          *                                       *
MI CH     *                                       *           *
-----------------------------------------------------------------------------------------
Chrysler - Nissan      Nissan - Chrysler
-----------------------------------------------------------------------------------------
          1995         1996         1997         1998         1999         2000         2001
      JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
CH NI                             *         *        * *                            *




NI CH *                     *           *        * *                  *         *           *
-----------------------------------------------------------------------------------------
Chrysler - Peugeot      Peugeot - Chrysler
-----------------------------------------------------------------------------------------
          1995         1996         1997         1998         1999         2000         2001
      JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
CH PE                                                           *         *
                                                                *
                                                                *

                                                                *
                                                                *
PE CH                                                   *         *         *
-----------------------------------------------------------------------------------------
```

```
Chrysler - Renault        Renault - Chrysler
------------------------------------------------------------------------------------------
          1995           1996           1997           1998           1999           2000           2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
CH RE                      *       *



                                            *
                                            *                                           *
RE CH                          *       *       *                    *                   *
------------------------------------------------------------------------------------------
Chrysler - Suzuki        Suzuki - Chrysler
------------------------------------------------------------------------------------------
          1995           1996           1997           1998           1999           2000           2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
CH SU          **
                *




SU CH
------------------------------------------------------------------------------------------
Chrysler - Toyota        Toyota - Chrysler
------------------------------------------------------------------------------------------
          1995           1996           1997           1998           1999           2000           2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
CH TO         ***      **       **   *     *  *    ** **                                  *   * *
              ***              *



           *                       *              *                    *   *
TO CH *      * *   *    **      * *       *   *  * **        *     *** ***      **  ** *
------------------------------------------------------------------------------------------
Chrysler - Volkswagen        Volkswagen - Chrysler
------------------------------------------------------------------------------------------
          1995           1996           1997           1998           1999           2000           2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
CH VW                              *          *           *          *    * *
                                             *           *          *
                                             *           *          *



                                                     *          *
                        *                            *        * *
VW CH *                    *         *            *   *        * *    * * *        **
------------------------------------------------------------------------------------------
```

```
Fiat - Ford        Ford - Fiat
-----------------------------------------------------------------------------------------
          1995          1996          1997          1998          1999          2000          2001
     JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FI FO              *   *       ** *            *   * **           *              *       **          *
                           **                      *                            *       **
                           **                                                   *       *


              *  *             **        *                *                              *
              *  *             **        *            * **                               *
FO FI    *   *  **     *      *  **       *            *  **                             *       *
-----------------------------------------------------------------------------------------
Fiat - General Motors     General Motors - Fiat
-----------------------------------------------------------------------------------------
          1995          1996          1997          1998          1999          2000          2001
     JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FI GM              *  *   *       ** *           *       **    *        *                 *        **
                           **              *            *              *                  *
                           **                                                            *


              *                **                *                          *        *
              **               **                *  *                       *    *   *
GM FI    **     *    *        ** *  **            *  *                *      *    *   *
-----------------------------------------------------------------------------------------
Fiat - Honda        Honda - Fiat
-----------------------------------------------------------------------------------------
          1995          1996          1997          1998          1999          2000          2001
     JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FI HO                                             *                                 *
                                                  *                                 *



                                                  *                     *
HO FI                                             *                     *
-----------------------------------------------------------------------------------------
Fiat - Hyundai       Hyundai - Fiat
-----------------------------------------------------------------------------------------
          1995          1996          1997          1998          1999          2000          2001
     JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FI HY                                          *



                                            *
HY FI                                        *
-----------------------------------------------------------------------------------------
```

```
Fiat - Mitsubishi     Mitsubishi - Fiat
-----------------------------------------------------------------------------------
        1995        1996        1997        1998        1999        2000        2001
    JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FI MI                             *     *          *     *
                                                  *




                                            *
MI FI                                       *
-----------------------------------------------------------------------------------
Fiat - Nissan     Nissan - Fiat
-----------------------------------------------------------------------------------
        1995        1996        1997        1998        1999        2000        2001
    JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FI NI                                                           *




                                                      *
NI FI                                           *             *
-----------------------------------------------------------------------------------
Fiat - Peugeot     Peugeot - Fiat
-----------------------------------------------------------------------------------
        1995        1996        1997        1998        1999        2000        2001
    JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FI PE             **      *       *        *        *       *        *       **
                 **                                        *               **
                 **                                        *                *

                 **                                                        *
                 **                                                        *
PE FI            **                                                        *
-----------------------------------------------------------------------------------
Fiat - Renault     Renault - Fiat
-----------------------------------------------------------------------------------
        1995        1996        1997        1998        1999        2000        2001
    JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FI RE            *  **        *        *                *        *        *        *
                 *  **                                           *                *
                 **                                             *                *

                 *  *                                       *               *
                 *  *                    *                  *               *
RE FI            *  *                  **      *      *     *               *
-----------------------------------------------------------------------------------
```

```
Fiat - Suzuki      Suzuki - Fiat
------------------------------------------------------------------------------------
           1995         1996         1997         1998         1999         2000         2001
      JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FI SU *                            *      **        *
       *                                  *


                                                              *
                                                              *
SU FI                                                         *                            *
------------------------------------------------------------------------------------
Fiat - Toyota      Toyota - Fiat
------------------------------------------------------------------------------------
           1995         1996         1997         1998         1999         2000         2001
      JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FI TO                              *      *                    *             *
                                                                            *
                                                                            *


                                                                            *
                                            *   *            *             *
TO FI                              *                         *   *   *      *
------------------------------------------------------------------------------------
Fiat - Volkswagen      Volkswagen - Fiat
------------------------------------------------------------------------------------
           1995         1996         1997         1998         1999         2000         2001
      JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FI VW          *  *   *      ** *      *** *   ** **      *      *      *              **
                            **        * *              *      *
                            **            *           *      *

          *                 **                      *
          *                 **                      *   *
VW FI     *      *   *      **        *            **   *                      **
------------------------------------------------------------------------------------
Ford - General Motors      General Motors - Ford
------------------------------------------------------------------------------------
           1995         1996         1997         1998         1999         2000         2001
      JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FO GM *  *** *** *** * * ********** * * ** *******    * * * **** ** *** ** *   ** *
         * *    ** * * ****** * *   * * *  ** ** *      * *    * *          *   *
         *      *     ****        * *    ** * *      *            *          *


        *   * *     *       ***        ** * * *   *   *       *      * * *
       **   * * *  ** *     ***    **  * ** ** * * ** **   **** **   *** **** *   *
GM FO ***  ** *** ***** * * *** *****    * ***** ********** ********   ********* * *  * ***
------------------------------------------------------------------------------------
```

```
Ford - Honda       Honda - Ford
-----------------------------------------------------------------------------------
          1995         1996         1997         1998         1999         2000         2001
      JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FO HO **   *   **     **   **       **            ** *     ** *  *         *    *  **    *       *          * *
         *         *     *          *       *          *   *  *               *    *
                                 *                                              *


                                            *            *               *
                                 *          *            *         *      *
HO FO       *  *     *       **          *     *   *   *      *         *         *                  *    **
-----------------------------------------------------------------------------------
Ford - Hyundai     Hyundai - Ford
-----------------------------------------------------------------------------------
          1995         1996         1997         1998         1999         2000         2001
      JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FO HY                       *                               *



                                            *
                                        *   *
HY FO                   *                    *   *                *            *   *              *
-----------------------------------------------------------------------------------
Ford - Mitsubishi     Mitsubishi - Ford
-----------------------------------------------------------------------------------
          1995         1996         1997         1998         1999         2000         2001
      JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FO MI                                 *       *  *  **     *  **      *
                                            *   *  **      *  **
                                                    *         **


                                                  *                  *
                                            *      *                  *
MI FO                           *             *        **             *      *
-----------------------------------------------------------------------------------
Ford - Nissan     Nissan - Ford
-----------------------------------------------------------------------------------
          1995         1996         1997         1998         1999         2000         2001
      JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FO NI ***  *             *          *      *  **     *    * *         *              *              *
        *                    *               *    *                 *
                                                                    *


                                            *                *
                                            *                *
NI FO *                         *** *        *  *       *  *      *                        *
-----------------------------------------------------------------------------------
```

```
Ford - Peugeot     Peugeot - Ford
-----------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FO PE       *    *         * *     ** *      *           *          *     *         * *     *
            *                * *       *                             *     *         *     *
            *                  *       *                             *     *         *

                         **                                                *         *
                         ***                                               *         *       *
PE FO             *   *** *                                                *        **        *
-----------------------------------------------------------------------------
Ford - Renault     Renault - Ford
-----------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FO RE    *    *          ** *    * *        *           *          * *   *          * *  *
              *                 *                          *                * *   *          *    *
              *                 *                                           *   *          *    *

                         * *                                                         *
                         * *                           *                             *
RE FO                    ***        *          *    *          *          *          *
-----------------------------------------------------------------------------
Ford - Suzuki      Suzuki - Ford
-----------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FO SU                                                      *                                    *



SU FO                                                            *                        **
-----------------------------------------------------------------------------
Ford - Toyota      Toyota - Ford
-----------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FO TO *     *  **    * *** * ** *      * *    ** ****      ***    **     *       *  *    * **
      *        *     ** *          * *     ** *          **      *     *         *     *
                    *                 *                  **            *         *

                         *   *          *          *          *                      *
      *          *   *    *    * *        * *    *    *          *          *          *   *
TO FO *       * *  *     **    **** ** *    ***    *  **   *  * *    *     *  **     * *  * *
-----------------------------------------------------------------------------
```

```
Ford - Volkswagen      Volkswagen - Ford
-------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
FO VW      *         *      ***** *        *     * **    *          *         *  *  *     *    ****
           *         *      *  ***              **    *            *         * *          **
           *                    **              *    *            *         *  *

           *                ***       *       *                      *       *
           *                *  ***        *       *              *   *    * *              **
VW FO      *         *  *   *  ****       **       **           *  **    * *      *         **
-------------------------------------------------------------------------------------
General Motors - Honda       Honda - General Motors
-------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
GM HO      *        * **** **    *** * ***      ****      * *    *     ***      **     *            *  **
           *             *       ** *  *   *   *  *       *            *                           *  *
                                 *                                     *

                                 *                         *        *
           *                *       *                       *        *   **
HO GM      *                **      ** *       **    *   *           * *  **                         *
-------------------------------------------------------------------------------------
General Motors - Hyundai      Hyundai - General Motors
-------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
GM HY                                   *                          *  *
                                                                  *
                                                                  *

                                        *
                                        *
HY GM                                   *                                   *
-------------------------------------------------------------------------------------
General Motors - Mitsubishi      Mitsubishi - General Motors
-------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
GM MI      *            *       *     *          *          *             *          *
           *                                    *          *             *
                                                           *

                                            *     *
           * *                              *     *     *
MI GM  * *                         *        *     *     *
-------------------------------------------------------------------------------------
```

```
General Motors - Nissan     Nissan - General Motors
-------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
GM NI  *          ** *  *    * ***      **    * **     ** **      ***                       **
       *              *        * **                    *            *
                              *                        *            *



                                         *                  *
        *                     * **      * **              *
NI GM  *                      * **  *   * ***     *  *      *         *
-------------------------------------------------------------------------------------
General Motors - Peugeot    Peugeot - General Motors
-------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
GM PE        *          ***      * *                        *          *   *   *       *
             *          ***                                *          *   *   *
             *          ***                                *              *   *



                        ***                                     *              *
                        ***                                     *              *
PE GM                   ***    *                        *  *         *       **
-------------------------------------------------------------------------------------
General Motors - Renault     Renault - General Motors
-------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
GM RE        *     *          **   * *        *           *         *          *   *       *
             *               **              *           *         *          *   *
             *               **              *           *         *          *   *



                           * *            *                                       *
                          * * *           *                                       *
RE GM          *          * ***   *  *     **            *                 *       *
-------------------------------------------------------------------------------------
General Motors - Suzuki     Suzuki - General Motors
-------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
GM SU



SU GM                                                   *                  *
-------------------------------------------------------------------------------------
```

```
General Motors - Toyota     Toyota - General Motors
------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
GM TO  **       ****** **  * *** * ***   * * **  *  ***    * *** **    *    *  *    *  **
       **          ** *   * **       *   *         *       * **        *  *        *
                               *                   *       * **        *  *


                          * *                     *                   *
       *   *         *   ** *          *   *       *             *     *
TO GM  *  *  *  *  *   **    ****    *   ***   * *     * *   *   *  **     **    *
------------------------------------------------------------------------------------
General Motors - Volkswagen      Volkswagen - General Motors
------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
GM VW  *    ** *  * * *      * *** *** **   ***        * *          *** *       **
       ** *   *         * ***    *       **        *  *            *  *         *
       *  *   *         ***               *        *  *            *            *


            *               ***       *       *         *     *           *
            *               ***       *      * *        *     *           *
VW GM  *    *       *    * ****   *   **    ** *       **    ***       *    *     *
------------------------------------------------------------------------------------
Honda - Hyundai      Hyundai - Honda
------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
HO HY


                                              *
                                              *     *                 *
HY HO              *                           **    *                 *
------------------------------------------------------------------------------------
Honda - Mitsubishi      Mitsubishi - Honda
------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
       JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
HO MI    *        *  * *      *             *             *
         *                   *             *


                                                             *
       *               *             *                       *
MI HO  *        *  **   *     *             **       * *  *   *   *  *
------------------------------------------------------------------------------------
```

```
Honda - Nissan     Nissan - Honda
------------------------------------------------------------------------------------
         1995         1996         1997         1998         1999         2000         2001
      JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
HO NI           *  *     *  *    *      *                      *                 * *     *
                *         *  *



                         *
                      *    *   *              *
NI HO  *              *  *   *   *   ***    **              *    *   *              *   *   * * *
------------------------------------------------------------------------------------
Honda - Peugeot     Peugeot - Honda
------------------------------------------------------------------------------------
         1995         1996         1997         1998         1999         2000         2001
      JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
HO PE                    *                                              *    *
                         *                                              *    *
                         *                                                   *


                      *                                                *
                      *                                                *
PE HO                 *                                                *
------------------------------------------------------------------------------------
Honda - Renault     Renault - Honda
------------------------------------------------------------------------------------
         1995         1996         1997         1998         1999         2000         2001
      JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
HO RE                    *                            *    *
                                                     *    *
                                                     *



             *
RE HO               *             *         *              *
------------------------------------------------------------------------------------
Honda - Suzuki     Suzuki - Honda
------------------------------------------------------------------------------------
         1995         1996         1997         1998         1999         2000         2001
      JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
HO SU  *                 *              *    *
                         *              *    *
                                        *    *


                      *
SU HO                 *                                *
------------------------------------------------------------------------------------
```

```
Hyundai - Peugeot     Peugeot - Hyundai
------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
          JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
HY PE                                                 *
                                                      *
                                                      *


PE HY
------------------------------------------------------------------------------------
Hyundai - Renault     Renault - Hyundai
------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
          JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
HY RE                                                 *                   *
                                                      *


RE HY
------------------------------------------------------------------------------------
Hyundai - Suzuki      Suzuki - Hyundai
------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
          JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
HY SU                                             *  *       *                  *
                                                  *


SU HY                                                         *                   *
------------------------------------------------------------------------------------
Hyundai - Toyota      Toyota - Hyundai
------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
          JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
HY TO                 *                     *       *       **    *        *          *
                      *                         *        *     *
                      *


                                                             *
TO HY                                                        *
------------------------------------------------------------------------------------
```

```
Hyundai  - Volkswagen      Volkswagen  - Hyundai
--------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
          JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
HY VW                                              *    *                   *
                                                   *    *
                                                        *



VW HY
--------------------------------------------------------------------------------------
Mitsubishi  - Nissan      Nissan - Mitsubishi
--------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
          JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
MI  NI  *               **    **    *                       *          *
        *                           *                       *
                                                            *



                            *
NI  MI               *  *    *    *    *               *           *           *
--------------------------------------------------------------------------------------
Mitsubishi  - Peugeot      Peugeot  - Mitsubishi
--------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
          JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
MI  PE                              *



                                              *
                                              *
PE  MI                              *          *
--------------------------------------------------------------------------------------
Mitsubishi  - Renault      Renault  - Mitsubishi
--------------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
          JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
MI  RE



                                              *
RE  MI                                        *
--------------------------------------------------------------------------------------
```

```
Mitsubishi - Suzuki      Suzuki - Mitsubishi
--------------------------------------------------------------------------------------
          1995          1996          1997          1998          1999          2000          2001
          JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
MI  SU                              *                                                   *
                                    *                                                   *
                                                                                        *


SU  MI                                                            *               *
--------------------------------------------------------------------------------------
Mitsubishi - Toyota      Toyota - Mitsubishi
--------------------------------------------------------------------------------------
          1995          1996          1997          1998          1999          2000          2001
          JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
MI  TO          ** *    *  * **                        **      *   *** *    *          *   *   *
                        *  * **                               *    **      *           *
                           *                                  *    *                   *


                                                              *
                                        *                     *
TO  MI          *   *                    *                     *   *    *
--------------------------------------------------------------------------------------
Mitsubishi - Volkswagen      Volkswagen - Mitsubishi
--------------------------------------------------------------------------------------
          1995          1996          1997          1998          1999          2000          2001
          JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
MI  VW



                                                                       *
VW  MI                                                                 *
--------------------------------------------------------------------------------------
Nissan - Peugeot      Peugeot - Nissan
--------------------------------------------------------------------------------------
          1995          1996          1997          1998          1999          2000          2001
          JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
NI  PE                         *                                        *
                                                                       *


                         *
PE  NI                   **                                       *
--------------------------------------------------------------------------------------
```

```
Nissan - Renault     Renault - Nissan
------------------------------------------------------------------------------------
           1995        1996        1997        1998        1999        2000        2001
         JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
NI RE                                        *                   *
                                             *




RE NI
------------------------------------------------------------------------------------
Nissan - Suzuki      Suzuki - Nissan
------------------------------------------------------------------------------------
           1995        1996        1997        1998        1999        2000        2001
         JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
NI SU




SU NI
------------------------------------------------------------------------------------
Nissan - Toyota      Toyota - Nissan
------------------------------------------------------------------------------------
           1995        1996        1997        1998        1999        2000        2001
         JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
NI TO  *      *      ***  ***** *  ***    * * *  * **  ***   *  **          *         * **
       *                 *   * **  * *    * *    * *       *    **   *
                             *                   *              *

                                      *                       *
                         **   *           *  *                *
TO NI  *       *     * *  *  *** * * *     * * *     **      * **  *        * * **
------------------------------------------------------------------------------------
Nissan - Volkswagen     Volkswagen - Nissan
------------------------------------------------------------------------------------
           1995        1996        1997        1998        1999        2000        2001
         JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
NI VW                   ** *      *   *          *                        *          *
                       **        * *            *
                       *                        *

                     *
                     *
VW NI                *                                                      *
------------------------------------------------------------------------------------
```

```
Peugeot - Renault      Renault - Peugeot
-------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
     JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
PE RE              *     **          *                          *   *              **
                        **              *                           *               *
                        **                                          *               *


                   *  *          *                                              *
                   *  *      *   **                                             *
RE PE              *  *  *    *  ***      *                          *       *           *
-------------------------------------------------------------------------------
Peugeot - Suzuki    Suzuki - Peugeot
-------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
     JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
PE SU




SU PE
-------------------------------------------------------------------------------
Peugeot - Toyota    Toyota - Peugeot
-------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
     JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
PE TO                    *                                      *            *        *
                                                                                     *
                                                                                     *


                    *                                                            *
                    *                   *                    *    *              *
TO PE               *  *                *                    *    *    *         *
-------------------------------------------------------------------------------
Peugeot - Volkswagen    Volkswagen - Peugeot
-------------------------------------------------------------------------------
          1995        1996        1997        1998        1999        2000        2001
     JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
PE VW                   ***     *                                     *        *        *
                        ***                                          *                 *
                        **                                           *


              *          **                                          *
              *          ***                                       *  *              *
VW PE         *          ***        *                       *      *  *             **
-------------------------------------------------------------------------------
```

```
Renault - Suzuki     Suzuki - Renault
------------------------------------------------------------------------------------
          1995         1996         1997         1998         1999         2000         2001
          JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
RE SU




SU RE
------------------------------------------------------------------------------------
Renault - Toyota     Toyota - Renault
------------------------------------------------------------------------------------
          1995         1996         1997         1998         1999         2000         2001
          JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
RE TO          *            *            *            *            *
               *                                                    *
                                                                    *

                    *                                               *
                    *         *                         *           *
TO RE               **  *  *  *                         *           *
------------------------------------------------------------------------------------
Renault - Volkswagen     Volkswagen - Renault
------------------------------------------------------------------------------------
          1995         1996         1997         1998         1999         2000         2001
          JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
RE VW        *          ***  *   *   *    *   *     **    *     *
                        ***                         *     *
                        ***                               *

          *             **                         *
          *             **        *              *   *    *
VW RE     *        *    **  *   *          *     *  **    *               *
------------------------------------------------------------------------------------
Suzuki - Toyota     Toyota - Suzuki
------------------------------------------------------------------------------------
          1995         1996         1997         1998         1999         2000         2001
          JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
SU TO                   *   *              *
                        *   *
                        *


                        *
TO SU                   *
------------------------------------------------------------------------------------
```

```
Suzuki  - Vol kswagen        Vol kswagen  - Suzuki
-------------------------------------------------------------------------------------
          1995         1996         1997         1998         1999         2000         2001
     JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
SU VW                                                                                   *



VW SU                                                                                   *
-------------------------------------------------------------------------------------
Toyota - Vol kswagen        Vol kswagen  - Toyota
-------------------------------------------------------------------------------------
          1995         1996         1997         1998         1999         2000         2001
     JFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASOND
TO VW              ** *   *   ***       * **              *
                   ** *           *       * *              *
                      *                 * *

                   *                              *
                   *                              *
VW TO              *         *           *        *                    *
-------------------------------------------------------------------------------------
```

Note: The author would like to thank Dr. Cannella who made it possible for this chart to be presented in this research. Basically this chart visually presents the number of competitive actions taken by each sample firm in different competitive dyads between Jan. 1995 to Dec. 2001. In each cell of this chart, on the first line, the names of two pairs competitors are introduced. On the second line the years being studied are listed. Using the first character of each month, the third line lists all the 84 months between Jan. 1995 and Dec. 2001. The number of competitive moves undertaken in each month is represented using asterisks appeared in each month column. One asterisk indicates one competitive move. Two asterisks indicate two competitive moves. Due to the constraint of space, more than 3 competitive actions are represented by three asterisks. Consider the first cell of this chart as an illustration. It provided information about the competitive actions initiated by Chrysler (initiator) against Fiat (target) and the competitive actions initiated by Fiat (initiator) against Chrysler (target) from Jan. 1995 to Dec. 2001. In August 1997, Chrysler initiated one competitive action against Fiat. Fiat initiated one competitive attack against Chrysler in Dec. 1999 and Feb. 2000 respectively.

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