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TO FORBEAR OR NOT TO FORBEAR?

A BEHAVIORAL PERSPECTIVE OF MULTIMARKET COMPETITION

by

Ana Elisa Arouca Iglesias

A Dissertation

Submitted in Partial Fulfillment of the Requirements for the Degree

of

Doctor of Philosophy

in the Robinson College of Business

of

Georgia State University

GEORGIA STATE UNIVERSITY
ROBINSON COLLEGE OF BUSINESS
2010

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2010

ACCEPTANCE

This dissertation was prepared under the direction of the Ana Elisa Arouca Iglesias Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctoral of Philosophy in Business Administration in the Robinson College of Business of Georgia State University.

Dean H. Fenwick Huss

DISSERTATION COMMITTEE

William Bogner (co-chair)

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ABSTRACT

Multimarket competition has become a substantial part of the modern economy. As such, it has drawn the attention of academics in both economics and strategy fields. Many studies have found empirical evidence of mutual forbearance in several industries, but despite its importance, its behavioral roots have not been explored. In my dissertation I integrate the reality of boundedly-rational decision makers into the mutual forbearance hypothesis. I apply an outgrowth of the behavioral theory of the firm – the shifting focus model of risk taking – to the study of competitive behavior. I propose a behavioral model of multimarket competition that focuses on corporate strategic decisions - market entry and exit decisions, regardless of entry mode (e.g. acquisitions) or exit mode (e.g. divestitures). This approach provides a granular view of changes in the business scope of the firms in terms of product and geographic markets served. I test my hypotheses in the U.S. property liability insurance industry over a 12-year period (1998-2008).

I argue that firms follow the mutual forbearance logic as long as their performance goals are satisfied. However, under conditions of adversity, firms shift attention to recovering from the performance shortfall and their actions deviate from the mutual forbearance predictions. This dissertation shows that underperforming firms with abundant slack take longer to forbear, and underperforming firms with limited slack start forbearing sooner, as predicted. By bridging behavioral and competitive perspectives to the study of market entry and exit decisions, I underscore the value of cross-fertilization in strategy research.

DEDICATION

To my husband Jose Luis and my daughter Liz

Glory be to him whose power, working in us, can do infinitely more than we can ask or imagine.
Ephesians 3, 20

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CHAPTER 1 – INTRODUCTION

Multimarket competition, "a situation where firms compete against each other simultaneously in several markets" (Karnani & Wernerfelt 1985, p. 87) has become a substantial part of the modern economy. As such, it has drawn an increased attention of academics in both economics and strategy fields (Baum and Greve 2001). The main assumption in multimarket theory is that firms avoid competitive attacks against those rivals they encounter across several markets, because of their increased interdependence – the so-called mutual forbearance hypothesis (Edwards 1955). For example, if firm A attacks B in market X where B is dominant, firm B may react not retaliating A in market X, but in market Y, where A has more to lose. Thus, in order to avoid the risk of retaliation, firms forbear from attacking each other in order to reap the benefits of decreased rivalry (Karnani & Wernerfelt 1985).

Multimarket contact has been shown to result in a decreased rivalry among competitors, reflected in higher prices (e.g. Evans and Kessides, 1994), higher profits (e.g. Piloff 1999), and higher growth (Haveman and Nonnemaker 2000). The benefits of having multimarket contact also suggest that firms pursue market entry and exit, i.e. to expand and contract its scope of businesses, according to the level of multimarket contact with competitors (e.g. Baum and Korn 1996). In spite of evidence in favor of the mutual forbearance hypothesis with respect to market entry and exit, a broad question that arises is: *Will firms always forbear from entry into a new market* or *exit from markets because of the threat of retaliation?* Or more specifically, my research question is:

What are the boundary conditions of the mutual forbearance hypothesis with respect to market entry and exit?

The mutual forbearance hypothesis has strong behavioral implications as it predicts how managers make entry and exit decisions under conditions of extended interdependence with rivals, or essentially, how managers *pursue risk* under such conditions. For example, entering into a target market can be considered a risky decision (Greve, 2000) and exiting from a focal market reflects risk aversion (Shimizu, 2007). Such behavioral roots of the mutual forbearance hypothesis are not adequately accounted for in the IO-based analysis of competitive dynamics. Predicting risk behavior according to firm performance and aspiration levels, the behavioral theory of the firm provides a natural contrast with the IO tradition and, therefore presents an opportunity to set out and test in the real world alternative hypotheses that are not fully consistent with each other.

This dissertation also acknowledges that research on multimarket competition has more extensively explored market entry decisions than exit decisions. Because the behavioral theory of the firm has significant value to add to our understanding of exit, I investigate whether and how firm performance relative to aspiration level influences the effect of multimarket contact on market exit decisions.

The remainder of the dissertation is organized as follows. Chapter 2 provides a review of multimarket competition research. It begins by describing core concepts and mechanisms in multimarket competition. I then review empirical studies on the relationship between multimarket contact and competitive behavior, with a particular emphasis on market entry and exit. I also provide an overview of studies on the behavioral theory of the firm and corporate strategy. The chapter concludes with a discussion of research issues that this dissertation seeks to address.

Chapter 3 provides a theoretical model of behavioral boundary conditions for the mutual forbearance hypothesis with respect to market entry and exit. First, I describe the research model and present the definition of multimarket contact. I then develop hypotheses that juxtapose the dominant perspective of multimarket competition from IO economics with alternative interpretations from the behavioral theory of the firm.

Chapter 4 describes the contextual setting in which the theoretical model will be tested. First, the research requirements and challenges for testing the theoretical model are presented. Next, I explain why the U.S. property and liability insurance industry is an appropriate empirical setting. Concluding the chapter, I provide a brief description of the industry.

The methodologies for empirical analyses are introduced in Chapter 5, the results are presented in Chapter 6, and the dissertation is concluded in Chapter 7, in which theoretical and managerial implications, limitations, and opportunities for future research are discussed.

CHAPTER 2 – LITERATURE REVIEW

2.1 Multimarket competition: core concepts and mechanisms

The theoretical roots of multimarket competition date back in the 1950's, coming from economics and sociology traditions. The idea that the multiplicity of contacts among firms can decrease the intensity of competition was first introduced by Edwards (1955). He hypothesized that multimarket rivals are attentive to how competitive moves in a given market impacts competition in other markets, and will tacitly coordinate their actions for the mutual benefit of all parties. Thus, firms competing with one another in several markets develop an *extended interdependence* in that competitive moves in one market may cause response in other markets. Extended interdependence is also known as *multimarket contact* (MMC) – an important construct in multimarket competition. The implication is that as the level of multimarket contact increases, the level of rivalry decreases – the so-called *mutual forbearance hypothesis*.

In the mutual forbearance logic, multimarket contact creates a *deterrence mechanism* (Karnani & Wernerfelt 1985), since firms are less likely to act aggressively due to the threat of retaliation in other markets. This effect has paramount importance because firms that can limit competitive pressures, that is to say decrease the level of rivalry, are typically able to earn higher rates of return than those that cannot (Porter 1980).

In their seminal paper, Bernhein and Whinston (1990) developed a game-theoretic model of mutual forbearance in which they formalize the conditions for the development of extended interdependence among firms. They contend that in situations where markets are identical, firms are identical, and technology exhibits constant returns to scale, multimarket contact does not aid in sustaining collusive outcomes – the *irrelevance result*. In other words, a mere agglomeration

of equal multimarket contacts alone does not help sustain forbearance. Hence, MMC may facilitate cooperation only if some conditions are met. First, it is important the presence of *asymmetries* either between the markets in which the same firms repeatedly interact with one another (e.g. asymmetries in rates of growth or decline) or between the firms within and across the multiple markets in which they interact (e.g. asymmetries in costs or demands). With asymmetries, rivals are motivated to cooperate as each firm expands in markets where it is strong and retreats from markets where it is weak. The presence of asymmetries underlies an important construct in multimarket competition - *spheres of influence*. Because not all markets are equally important to a given firm, firms may informally recognize the other's primacy of interest in markets important to the other, hoping that its own interests will be similarly respected. For example, firm A will let firm B to dominate an important market for B, hoping that B will let A to dominate in an important market for A.

By extension, *repeated interaction* is another condition for mutual forbearance. When the probability of continuing interaction is high, firms may be able to transfer incentive constraints from a market where cooperation is sustainable to another where it is not – the *transfer of market power* mechanism. However, the sustainability of cooperation depends on the credibility of the punishment threat, so that firms do not have incentives to deviate from the competitive equilibrium. Indeed, one of the main assumptions of the model is that defections are always detected and punished – the *perfect monitoring* condition. In addition, none of the firms should be able to gain more from deviating from its punishment strategy that it would subsequently lose as a result of its deviation. In sum, it is both the prospect of gains stemming from cooperation and the threat of retaliatory punishment in the future that sustain cooperation in the present.

New theoretical advances in multimarket competition have refined and expanded the Bernheim and Whinston's model. Matsushima (2001) has challenged the perfect monitoring condition, showing that multimarket contacts can hold collusive equilibrium in place even when firms cannot perfectly monitor their rivals. He theoretically proves that the collusive equilibrium can be sustained if multimarket contacts make it easier to detect such defections. For example, defection is less likely when a focal firm has many multimarket contacts in the focal market, because the number of contacts increases the likelihood that the defection can be discovered.

Another condition that has been challenged is the asymmetry condition. Using game-theoretical modeling, Spagnolo (1999) proves that, irrespective of whether there are asymmetries of any kind, multimarket contact *always* facilitates collusion when firms' objective are concave, i.e. firms are risk averse. This may be explained as follows. First, a strictly concave objective function makes the strategic interactions interdependent: firms' evaluation of profits in one market depends on profits realized in other markets. Second, the expected utility losses from simultaneous retaliations in more markets are larger than (the sum of) those from independent retaliations. Since incremental losses weigh more heavily than incremental gains when the objective function is concave (Kahneman and Tversky 1979), multimarket contact gives firms incentives to respect the tacit agreements. Evidently, the effect of multimarket contact is strengthened under conditions of asymmetry or any other conditions postulated by Bernheim and Whinston (1990).

Finally, an important condition for mutual forbearance to take place is that firms must have internal coordination mechanisms (Jayachandran et al. 1999). As Golden and Ma (2003, 480) put it "coordination *between* firms often requires coordination *within* firms." This mechanism

ensures that unit managers make decisions consistent with the corporation's goals, thus avoiding unnecessary cross-market retaliation from rivals.

The basic model of multimarket competition is shown in Figure 2.1. This figure illustrates that the extent to which firms are interdependent affects their competitive decisions which may involve aggressive or cooperative behaviors. These decisions may involve changes in price or changes in a firm's scope of businesses (e.g. Baum and Korn 1996). In this case, the multimarket structure is impacted as firms enter and exit from markets. Finally, competitive behavior influences organizational outcomes, such as enhanced performance (e.g. Gimeno and Woo 1996) or stability in market shares (e.g. Heggestad and Rhoades 1978).

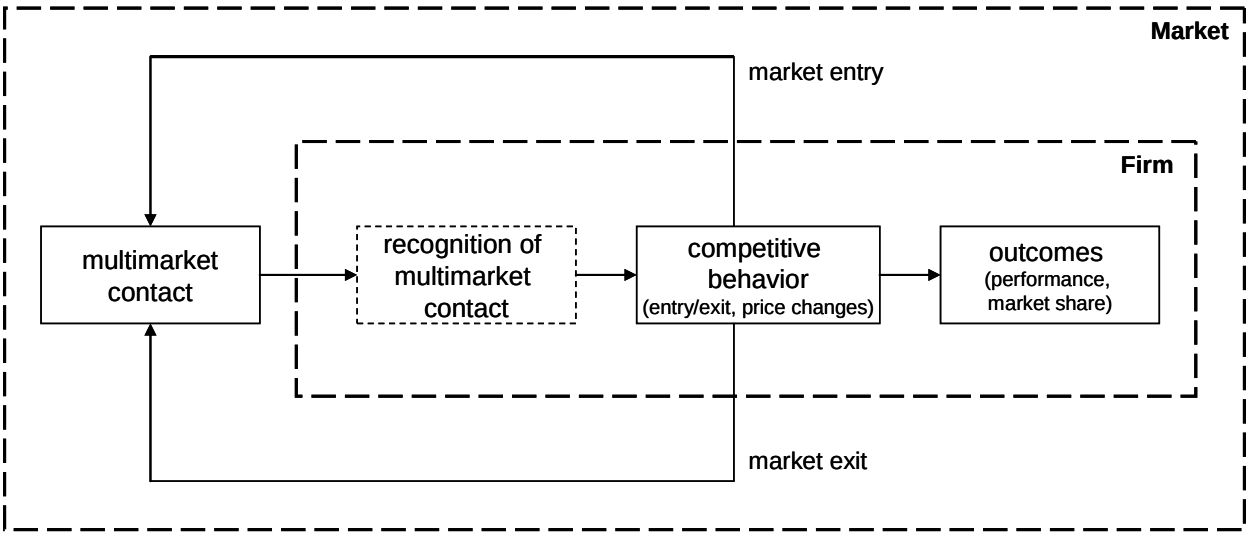


Figure 2.1 – Basic model of multimarket competition

In the next section, I review empirical work on this relationship, using a well known terminology for extended interdependence: *multimarket contact*. Multimarket contact is broadly defined here as a focal firm's encounters with its focal market's rivals in markets outside focal market. In this conceptualization, multimarket contact is not just another aspect of industry

structure, but, rather, is experienced differently by firms with different product and/or geographic scopes.

2.2 Multimarket contact and competitive behavior

In the next paragraphs, I review empirical studies that examine the relationship between multimarket contact and competitive behavior published in the past thirty years. First, I provide a broad literature review on multimarket competition, organized in two periods: 1978-1999 and 1999-2008. For the first period I relied on two articles that summarize past quantitative findings (Jayachandran et al., 1999; Korn and Baum, 1999), and for the second period, I conducted a new literature search. After broadly reviewing the studies from both periods, I focus on empirical studies that examine the main constructs of this dissertation – market entry and exit – which are reviewed in turn.

2.2.1 The 1978-1999 period

Two articles summarize quantitative findings for this period: Jayachandran et al. (1999) and Korn and Baum (1999). The former identified twenty studies, whereas the latter identified nineteen studies (Table 1). Thirteen articles figure in both reviews, meaning that Jayachandran et al. (1999) cites seven articles not cited by Korn and Baum (1999), and that Korn and Baum (1999) cites six articles not cited by Jayachandran et al. (1999), as shown in Table 2.1. A close analysis of the non-cited papers offers possible explanations for those papers not being cited in the reviews. Jayachandran et al. (1999) only cite journal articles. Consequently, conference papers are not cited (Gimeno and Korn 1994; Whitehead 1978). However, the review does not cite three studies supporting evidence of mutual forbearance (Cotterill and Haller 1992; Martinez

1990; Scott 1991) and one study not supporting it (Strickland 1985). Korn and Baum (1999) does not cite studies published in 1999 (Gimeno 1999; Gimeno and Woo 1999), possibly because they were available in the same year as the review's publication. However, the review does not cite five articles featuring important evidence of multimarket competition (Fernandez and Marin 1998; Jans and Rosenbaum 1996; Parker and Roller 1997; Sandler 1988; Singal 1996). The final list of articles contains twenty-five empirical studies, as shown in Table 2.2.

Table 2.1 – Articles featured in literature reviews on multimarket competition (1978-1999)

Articles cited in Korn and Baum (1999) and Jayachandran et al. (1999)	**Articles cited in Korn and Baum (1999) only**	**Articles cited in Jayachandran et al. (1999) only**
Heggestad and Rhoades (1978) Scott (1982) Alexander (1985) Feinberg (1985) Rhoades and Heggestad (1985) Mester (1987) Barnett (1993) Hughes and Oughton (1993) Evans and Kessides (1994) Gimeno and Woo (1996) Baum and Korn (1996) Boeker, Goodstein, Stephan, Murmann (1997) Baum and Korn (1999)	Whitehead (1978) Strickland (1985) Martinez (1990) Scott (1991) Cotteril and Haller (1992) Gimeno and Woo (1994)	Sandler (1988) Singal (1996) Jans and Rosenbaum (1996) Parker and Roller (1997) Fernandez and Marin (1998) Gimeno (1999) Gimeno and Woo (1999)

Empirical work in both economics and strategy fields captured in the combined list presented some conflicting results about the occurrence of mutual forbearance among firms. Five studies found results contrary to mutual forbearance hypothesis (Alexander 1985; Mester 1987; Rhoades and Heggestead 1985; Strickland 1985; Whitehead 1978). However, twenty studies carried out in diverse industry settings found evidence of mutual forbearance (Heggestad and Rhoades 1978; Scott 1982; Feinberg 1985; Sandler 1988; Martinez 1990; Scott 1991; Cotteril and Haller 1992; Barnett 1993; Hughes and Oughton 1993; Singal 1996; Evans and Kessides

1994; Baum and Korn 1996; Gimeno and Woo 1994; Jans and Rosenbaum 1996; Boeker, Goodstein, Stephan, and Murmann 1997; Parker and Roller 1997; Fernandez and Marin 1998; Baum and Korn 1999; Gimeno 1999; Gimeno and Woo 1999). According to Jayachandran et al. (1999), one possible explanation for the lack of support might be the use of cross-sectional rather than longitudinal data. Indeed, four out of five studies use cross-sectional settings except for Rhoades and Heggestead (1985), all other, and not surprisingly, empirical evidence based on longitudinal studies has largely supported the deterrence effect of multimarket contact on the intensity of competition.

Table 2.2 – Empirical studies on multimarket competition (1978-1999)

Studies	Sample and period	Findings
Heggestad and Rhoades (1978)	Top three bank holding companies in 187 banking areas, 1966-1972	Greater market share stability in local markets with greater MMC
Whitehead (1978)	Florida bank holding companies, 1976	The results were contrary to mutual forbearance hypothesis: service changes and loan rates and fees higher in markets with high MMC
Strickland (1985)	195 top U.S. manufactures in 408 SICs, 1963	The results were contrary to mutual forbearance hypothesis: firm profits lower in SICs with higher MMC
Scott (1982)	437 U.S. manufacturers, 1974	Interaction between MMC and concentration has a significant effect on market share instability
Alexander (1985)	Bank holding companies in six states, 1975	The results were contrary to mutual forbearance hypothesis: service changes and loan rates and fees higher in markets with high MMC. However, quadratic interaction effects of MMC and concentration were significant
Feinberg (1985)	391 U.S. multiproduct firms, 1982	Higher cost-price margins in industries where MMC high; Quadratic interaction between MMC and concentration
Rhoades and Heggestad (1985)	1074 banks in 154 U.S. markets, 1970-1979	Lack of evidence of mutual forbearance hypothesis: no effect of MMC on ROA, service charges, or loan rates and fees
Mester (1987)	171 savings and loan firms in California, 1982	The results were contrary to mutual forbearance hypothesis: market share instability, service charges, and loan rates and fees higher, and ROA lower, in markets with high MMC;

		When MMC was accompanied by high concentration, the intensity of competition was greater
Sandler (1988)	123 U.S. airline markets, before (1974-1976) and after (1978-1980) deregulation	MMC is related positively to rivalry
Martinez (1990)	100 largest bank holding companies, 1984-1989	Greater stability in size rankings of banks in local markets with greater MMC
Scott (1991)	64 U.S diversified firms in 35 oligopolistic industries, 1950	MMC leads to better firm performance; diversified sellers' concentration has its strongest effect on profits earned within an industry when MMC among the sellers is high
Cotteril and Haller (1992)	20 largest U.S. supermarket chains, 1971-1981	Lower market entry rates when the number of other large chains in the market already high
Barnett (1993)	Life history of every firm in the CPES sector of the telephone industry, 1981-1986	Lower exit rates from state markets with higher MMC.
Hughes and Oughton (1993)	418 U.K. manufacturers in 134 three-digit SIC industries, 1979	Price-cost margins and industry rate of return on capital higher in industries with higher MMC
Singal (1996)	14 mergers among airline companies, 1984-1987	Airlines earned higher yields when MMC higher
Evans and Kessides (1994)	1000 largest U.S. airline city-pair routes, 1984-1988	Major airlines set higher fares on routes with higher MMC
Baum and Korn (1996)	40 California commuter airlines, 1979-1984	Lower entry and exit rates from routes where MMC with competitors higher; interaction between MMC and spheres of influence was significant, whereas interaction between MMC and concentration was insignificant
Gimeno and Woo (1994, 1996)	48 airlines in 3171 U.S. city-pair routes, 1984-1988	Major airlines earned higher yields on routes where their MMC with competitors higher; Strategic similarity moderately increases rivalry
Jans and Rosenbaum (1996)	25 U.S. regional cement markets, 1974-1989	Interaction between MMC and concentration has a significant positive effect on price
Boeker, Goodstein, Stephan, Murmann (1997)	286 California hospitals in 163 product markets (services), 1980-1986	Lower exit rates from product markets where MMC with competitors higher
Parker and Roller (1997)	U.S. mobile telephone industry	Firms set higher prices where MMC higher
Fernandez and Marin	2221 hotel establishments in	MMC has a positive effect on collusion at low levels of

(1998)	Spain	concentration; and a negative effect at high levels of concentration
Baum and Korn (1999)	15 California commuter airlines, 1979-1984	Inverted U-shaped relationship between rates of market entry and exit and MMC; Interactions (MMC and relative MMC, MMC and relative firm size) were significant
Gimeno (1999)	48 airlines in 2897 U.S. city-pair routes, 1984-1988	Reciprocal MMCs decreases rivalry (high prices) and increases market share sustainability more than nonreciprocal MMCs
Gimeno and Woo (1999)	28 airlines in 3000 U.S. city-pair routes, 1984-1988	MMC correlates with economies of scope; MMC have a greater effect on prices and performance when they occur in markets that share economies of scope

In examining mutual forbearance, researchers have measured the intensity of competition using different approaches. Some studies infer the operation of mutual forbearance from higher profits (Hughes and Houghton 1993; Feinberg 1985; Scott 1982, 1991), higher prices (Evans and Kessides 1994; Fernandez and Marin 1998; Jans and Rosenbaum 1996; Parker and Roller 1997), higher yields (Gimeno and Woo 1994, 1996; Singal 1996), greater market share stability (Heggestad and Rhoades 1978), and greater stability in size rankings (Martinez 1990).

Rather than examining the outcomes, other studies measure the intensity of competition through actual market entry and/or exit behavior (Barnett 1993; Boeker et al. 1997; Baum and Korn 1996), applying the mutual forbearance hypothesis in the following way: Firms are less likely to enter new markets in which the multimarket contact with incumbents is high, and are less likely to exit from current markets in which the multimarket contact is high.

2.2.2 The 1999-2008 period

Empirical work conducted during this period is shown in Table 2.3. An interesting characteristic of this period is that studies move away from traditional industries (e.g.

manufacturing and banking), examining multimarket competition in empirical settings as diverse as the prescription drug industry (Shankar 1999), the software industry (Young et al. 2000), newspapers chains (Fu 2003), and fast food chains in Texas (Kalnins 2004). Also, studies look at multimarket issues in countries other than the U.S., such as Canada (Li & Chuang, 2001; Li & Greenwood, 2004), Japan (Greve 2000, 2006), Norway (Greve, 2008b), and Spain (Fuentelsaz & Gomez 2006), and many examine multimarket behavior across countries (Chintagunta & Desiraju 2005; Gimeno, Hoskisson, Beal, & Wan, 2005; Yu & Cannella 2007). Broadening the scope of multimarket studies has greatly contributed to the field. For example, there is now mounting evidence of mutual forbearance in under-researched industries as well as other countries, a situation that strengthens the theoretical validity of multimarket constructs and that adds more reputation to research on competition in multimarket contexts.

Similarly to earlier studies, some empirical studies infer mutual forbearance from evidence of decreased rivalry or enhanced performance. Findings of these studies do not differ substantially from those reported by Jayachandran et al. (1999) and Korn and Baum (1999). In general, the evidence of mutual forbearance under conditions of high multimarket contact is still supported, in terms of both decreased rivalry (Chintagunta and Desiraju 2005; Shankar 1999) and enhanced performance (Fu 2003; Gupta 2001; Li and Greenwood 2004; Pilloff 1999).

Table 2.3 – Empirical studies on multimarket competition (1999-2008)

Studies	Sample and period	Findings
Korn and Baum (1999)	15 California commuter airlines in 105 competitor dyads, 1979-1984	MMC may arise more as a result of chance and imitation of market choices of high-performing competitors than as a result of purposive MMC

Pilloff (1999)	6233 U.S. banks, 1992-1995	MMC outside of a reference market lessens competition in the reference market and hence enhances performance (ROA) of a focal bank
Shankar (1999)	23 entries and 59 incumbent responses from the U.S. prescription drug industry, 1970s and the 1980s	A brand's introductory marketing spending is lower if the entering firm has MMC with the incumbents.
Greve (2000)	174 Tokyo-based banks in 20 geographic markets, 1894-1936	Density dependence, imitation of large firms' decisions, and momentum are sufficient for predicting branch location decisions. Organizations are likely to establish multimarket contacts with single-market competitors, but unlikely to do so with multimarket competitors, contradicting the mutual forbearance hypothesis
Haveman and Nonnemaker (2000)	321 California savings and loan companies in 58 counties, 1977-1991	Inverted U-shaped relationship between rates of market growth and entry and MMC; interaction between MMC and market dominance was positively significant
Young, Smith, Curtis, Grimm, Simon (2000)	152 observations of 20 U.S. software firms, 1987-1991	Less attacks in product markets where MMC with competitors higher, and faster retaliation in product markets where MMC with competitors higher
Gupta (2001)	1738 projects with 8943 bids in highway procurement auctions in Florida, 1981-1986	Propensity to collude increases with MMC as repeated contacts among firms are found to have a positive effect on the winning low bid which leads to higher profit.
Li and Chuang (2001)	232 Canadian general insurance companies, 1992-1998	Multimarket firms' performance in a given market depends on the number and simplicity of their strategic actions – both absolutely and vis-à-vis those of others competing in the market unit.
Audia, Sorenson, Hage (2001)	All American shoes manufacturing plants, 1940-1989	As the degree of multimarket contact increases, the likelihood of firm exit declines.
Gimeno (2002)	28 airlines in 3000 U.S. city-pair routes, 1984-1988	Multimarket contacts established by chance have the same effect on competition as intentional multimarket contacts
Fu (2003)	465 daily newspapers in the U.S. midwestern states, 1998	Evidence of spheres of influence: strong linkage between the MMC and reduced circulation competition. Also, advertising rates are distinctly higher in MMC markets
Stephan, Murmann, Boeker, Goodstein (2003)	395 hospitals in California in 163 product markets (services)	Inverted U-shaped relationship between rate of market entry and MMC; CEO tenure has an effect on the relationship: newer CEOs persisted in entering the market of their rivals, even at higher levels of MMC

Kalnins (2004)	978 units of 3 fast-food chains in Texas, 1980-1995	Lower entry rates into locations with same franchise branches present (i.e. markets with large divisional MMC)
Li and Greenwood (2004)	276 Canadian general insurance companies, 1993-1998	Main effects: Multimarket competition per se results in lower performance. Moderators: Resource similarity positively moderates the relationship between MMC and performance MMC between dissimilar firms may fail to deter competitive aggression because they have not developed familiarity with each other, which enables forbearance and raises performance
Chintagunta and Desiraju (2005)	Observations on antidepressants (Prozac, Zolotf, and Paxil) across the U.S., the U.K., Germany, France, and Italy	Evidence of spheres of influence: Market interactions in the U.S. market soften competition in the Italian market, but make the interactions between brands more competitive in the U.K. market.
Gimeno, Hoskisson, Beal, Wan (2005)	43 U.S. telecommunications firms in 5 countries, 1985-1995	Domestic market positions of focal firms and prior movers influence mimetic international entry behavior.
Gimeno, Chen, Bae (2006)	54 US airlines in 4,994 domestic city-pair markets, 1979-1995	Firms faced with intense rivalry reposition themselves away from the most similar competitors in terms of served markets (those with high market overlap)
Greve (2006)	174 Tokyo-based banks, 1894-1936	Firms avoid extensions of MMC beyond the minimum of 2 contacts Firms enter markets with competitors that have high intentional contact.
Fuentelsaz and Gomez (2006)	77 Spanish savings banks, 1986-1999, 34,529 bank-market-year observations	Main effect: There is an inverted U-shaped relationship between MMC and market entry rate Moderators: The effect of MMC is greater when multimarket rivals are more dissimilar, and is lesser when contacts are reciprocal.
Yu and Cannella (2007)	13 largest global automobile firms, 27 countries, 1995-2001	The degree of MMC an MNE has with a given rival is positively related to its response speed.
Greve (2008b)	329 firms from the insurance industry in Norway, 1912-1986	Defection from mutual forbearance is more likely in markets where the focal firm has few multimarket contacts since the probability of detection is lower in such markets.

For instance, Fu (2003) found that newspaper chains reduce circulation competition. From the spheres of influence logic, newspaper chains decrease the level of rivalry in non-core markets in order to signal subordination to rival chains, expecting the same treatment in their core markets

(Gimeno, 1999). Advertising rates are also found to be relatively higher in MMC markets (Fu 2003). Pilloff (1999) also reports enhanced firm performance in a longitudinal study of 6,000 U.S. banks. He found that a firm's presence in markets outside the firm's core market lessens competition, thus leading to enhanced firm performance.

Of particular importance, recent empirical work has challenged some of the mutual forbearance assumptions. For example, in its original conceptualization, the mutual forbearance model assumes perfect monitoring, that is to say, defections from the collusive equilibrium are always detected and punished (Bernheim and Whinston 1990). However, Matsushima (2001) theoretically proved that collusive equilibrium can be held under conditions of imperfect monitoring if the likelihood of being discovered is high. Greve (2008b) tested this argument by conducting his research in an empirical context with less observable pricing and quality – the insurance industry in Norway – and found support for these ideas.

Another important point about recent research on multimarket competition is that studies within strategy field, different than those within IO economics (e.g. Evans and Kessides 1994), use information on actual competitive actions to measure competitive behavior, rather than inferring mutual forbearance from higher prices, for example. Young, Smith, Curtis, Grimm and Simon (2000), providing an empirical test of Chen's (1996) propositions, found that under conditions of high MMC with competitors, an attack is less likely, but if it occurs, the retaliation will be faster. In a large scale study, Yu and Cannella (2007) found similar results among the thirteen largest global automobile manufacturers operating in 27 countries. Li and Chuang (2001) examined the impact of competitive interaction among multimarket firms at the market level, and found that market share in a given market depends on the number and simplicity of

their strategic actions – both absolutely and vis-à-vis those of others competing in the market unit.

Market entry and exit, as observable events of competitive behavior (Chen 1996) have been extensively investigated. Since this dissertation focuses on the relationship between multimarket contact and market entry/exit decisions, empirical research on this relationship is summarized and reviewed in the next section.

2.3 Competitive antecedents of market entry and exit

Table 2.4 presents detailed information about each study on the relationship between multimarket contact and market entry/exit: form of relationship, types of markets, moderators, empirical setting, and empirical testing issues (MMC's level of analysis and scaling, whether MMC is weighed by importance, methodology used, and whether hypotheses are supported).

2.3.1 Form of relationship

Eight studies examine market entry decisions only (Korn and Baum 1999; Greve 2000; Haveman and Nonnemaker 2000; Stephan et al. 2003; Fuentelsaz & Gomez 2006; Greve 2006), two studies examine market exit decisions only (Barnett 1993; Boeker et al. 1997), and two studies examine both market entry and exit decisions (Baum and Korn 1996, 1999).

Studies have predicted different forms of relationship between multimarket contact and market entry/exit. Earlier empirical work has examined the dampening effects of multimarket contact on rates of entry and exit (Barnet 1993; Baum and Korn, 1996; Boeker et al. 1997), as they hypothesize a negative linear relationship between the constructs. Results support the operation of mutual forbearance, since market entry and exit rates decrease as multimarket

contact increases. Indeed, the theoretical logic in earlier work has been primarily built on the forbearance effect that is created once multimarket contact levels are high. However, it does not explain how multimarket structures are created in the first place (Korn & Baum 1999). As Stephan et al. (2003, p. 404) put it: "Firms and their managers, not only find themselves in multimarket structures, but must construct them as well."

In filling this gap, recent studies have proposed a revised relationship between multimarket contact and competitive behavior. Studies have consistently found an inverted-U-shaped rather than a negative linear relationship between multimarket contact and market entry (Baum & Korn 1999, Greve 2006; Haveman & Nonnemaker 2000; Stephan et al. 2003; Fuentelsaz & Gomez 2006), as shown in Figure 2.2. This relationship is characterized by escalation of competition below a certain threshold for which the likelihood of competing aggressively reaches its maximum, and de-escalation of competition above this threshold, when firms recognize the interdependence of their markets, and because of the threat of retaliation, do not engage in aggressively competitive behavior.

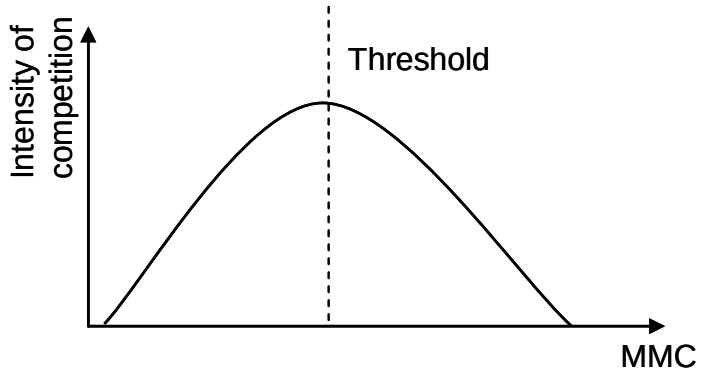


Figure 2.2 – Inverted U-shaped relationship between multimarket contact and competitive behavior

Evidently, there are alternative explanations for market entry and exit. Some studies propose behavioral models with competing hypotheses in which the initiation and further expansion of multimarket contact have antecedents other than the level of multimarket contact (Greve 2000; Korn & Baum 1999), and, at the extreme, these decisions can be attributed to chance (Korn & Baum 1999). Researchers in this stream draw from organizational ecology, behavioral, and institutional theories, and argue that if multimarket contact is such a pervasive construct, it is important to examine other causes for its creation and existence.

Korn & Baum (1999) examines the influence of chance, behavioral, and mimetic processes in the creation of multimarket structures. They found that multimarket structures will emerge as a result of chance but that subsequent market entry will be determined by mimetic processes. Similarly, Greve (2000) examine market entry decision by proposing four competing predictions. Market entry decisions can be influenced by density of firms in the focal market (the organizational ecology argument), mimetic processes in which firms will seek legitimacy (the institutional argument), momentum processes in which firms will repeat behaviors that have been successful in the past (the behavioral argument), and mutual forbearance processes in which

Table 2.4 – Empirical research on MMC and Market Entry/Exit

Article	**Competitive behavior**	**Form of relationship**	**Moderators**	**Types of Markets**	**MMC level of analysis and scaling**	**MMC weighed by importance?**	**Methodology**	**Hypotheses supported?**
Barnett (1993)	Exit	Negative linear		Geographic	firm-in-market (count)	No	Event history analysis	Yes
Baum & Korn (1996)	Entry / Exit	Negative linear	Market dominance	Geographic	firm-in-market (percentage)	No	Event history analysis	Yes
Boeker et al. (1997)	Exit	Negative linear		Product (hospital services)	firm-in-market (percentage)	No	Logistic Regression	Yes
Baum & Korn (1999)	Entry / Exit	Negative Curvilinear	Relative size, relative MMC	Geographic	Dyad (count)	No	Event history analysis	Yes
Korn & Baum (1999)	Entry	Positive Linear		Geographic	Dyad (count)	No	Event history analysis	No
Greve (2000)	Entry	Positive Linear		Geographic	firm-in-market (count)	No	Event history analysis	No
Haveman & Nonnemaker (2000)	Entry	Negative curvilinear	Market dominance	Geographic	firm-in-market (proportion)	No	Event history analysis	Yes
Stephan, Boeker, Goodstein, and Murmann (2003)	Entry	Negative Curvilinear	CEO tenure	Product (hospital services)	firm-in-market (percentage)	No	Logistic Regression	Yes
Fuentelsaz & Gomez (2006)	Entry	Negative Curvilinear	Concentration, reciprocity, resource similarity	Geographic	firm-in-market (percentage)	Yes	Event history analysis	Yes
Greve (2006)	Entry	Negative Curvilinear		geographic	firm-in-market (count)	No	Event history analysis	Yes

firms will seek deterrence (the forbearance argument). He found that market entry decisions involve momentum and mimetic processes, and mutual forbearance benefits are the least concern for decision-makers.

Interestingly, by focusing on the bottom line of multimarket strategies – *the performance effect* of intentional and unintentional multimarket contacts – Gimeno (2002) was able to reconcile both views on the emergence of multimarket contacts. Using the typology of strategies developed by Mintzberg et al. (1985), he views the intentional market expansion as a *deliberate strategy,* and the unintentional market expansion determined by chance, as an *emergent strategy*. He examined the influence of these strategies on subsequent performance and found that multimarket structures will lead to a higher level of performance, regardless of the type of strategy pursued. In other words, the performance effect is determined by the *realized strategy.*

2.3.2 Moderators

Equally importantly, studies have also examined whether and how moderators influence the relationship between multimarket contact and market entry and exit. Baum & Korn (1996) and Haveman & Nonnemaker (2000) found a significant positive moderating effect of market dominance on market entry, meaning that the effect of multimarket contact will be stronger in markets dominated by a very few firms, which is consistent with IO expectations (Porter 1980).

Asymmetry in competitors' size also has an impact on the mutual forbearance effect. For example, Baum and Korn (1999) found that as multimarket contact increases, smaller competitors will be *less* likely to enter and *more* likely to exit from a larger competitors' markets. Moreover, asymmetry in a firm's level of multimarket contact with a given competitor relative to the firm's other competitors can also have an effect on the relationship between the

multimarket contact and market entry. Specifically, Baum and Korn (1999) found that firms direct their competitive efforts towards low multimarket contact competitors as a consequence of forbearing from rivalrous actions with competitors with which they have higher multimarket contact. Similarly, the operation of the *spheres of influence* was found significant as the reciprocity of contacts amplifies the dampening effect of multimarket contact on market entry rates (Fuentelsaz & Gomez 2006).

Theoretical studies have long emphasized the importance of bringing resource similarity into competitive dynamics theory (Chen 1996; Jayachandran et al., 1999), and empirical studies have confirmed the significant effects of resource similarity on the relationship between multimarket contact and intensity of competition. For example, multimarket contact is more influential on competitive actions of firms with dissimilar resources (Fuentelsaz & Gomez, 2006), as the information provided by the multimarket contacts might be the only mechanism in achieving tacit coordination when interfirm dissimilarity impairs the interpretation of mutual forbearance signals.

Only one study examines the effects of risk preferences on the mutual forbearance hypothesis. Stephan et al. (2003) focus on the role of a firm's CEO in pursuing strategic change, represented by entry into new markets. They argue that newer and longer-tenured CEOs are likely to have different preferences for particular competitive actions. Whereas the former has a mandate for change and are less likely to abide by the tacit agreements with competitors, the former are more likely to rely on what worked for them in the past. Consequently, longer-tenured CEOs would be more sensitive to the implications of multimarket contact than newer CEOs. Accordingly, they found support for these arguments.

In sum, current research in market entry and exit have examined the moderating effects of independent variables at the market- (market dominance), the firm- (CEO tenure), and the dyad levels (relative size, relative multimarket competition, and resource similarity).

2.3.3 Empirical setting

The majority of studies examines market entry and exit in geographic markets (Barnett 1993; Baum and Korn 1996, 1999; Korn and Baum 1999; Greve 2000, 2006; Haveman and Nonnemaket 2000; Fuentelsaz and Gomez 2006). Only two studies analyze entry into and exit from product markets (Boeker et al. 1997; Stephan et al. 2003), specifically the hospital services.

It is important to understand the empirical context in which the studies have been conducted. I was able to identify characteristics of the industries under observation in seven studies (Barnett 1993; Baum and Korn 1996, 1999; Korn and Baum 1999; Fuentelsaz and Gomez 2006; Greve 2000, 2006), but for the remaining studies (Boeker et al. 1997; Haveman and Nonnemaker 2000; Stephan et al. 2003), I had to search for authors' previous articles.

Baum and Korn (1996, 1999) tested their hypotheses using data describing city-pair market changes of commuter air carriers operating in California from 1979 to 1984. In this period, federal deregulation triggered an intense period of reorientation and competitive interaction. Fuentelsaz and Gomez (2006) look at entry behavior into new geographic markets in the Spanish savings banks industry after industry's deregulation – when restrictions to branching were eliminated – between 1986 and 1999. They explicitly report that multimarket contact in 1986 was almost inexistent. Greve (2000, 2006) examine the establishment of Tokyo-based banks in 20 geographic markets. Haveman and Nonnemaker (2000) use data from the savings and loan associations (thrift) operating in California between 1977 and 1991. During this period, thrifts

faced deregulatory initiatives that transformed their competitive environment from placid and constrained to uncertain and volatile (Haveman 1993). Finally, Stephan et al. (2003) examined hospitals in California in the period between 1980 and 1986. This was a particularly turbulent period for the U.S. health care sector in which new regulations intensified competition (Goodstein, Boeker, and Stephan 1996).

In sum, although the reviewed studies use data from different time periods and different industries (thrifts, savings banking, airlines, hospitals), they have one aspect in common: that the industries under observation were experiencing intense regulatory changes and heightened competition.

2.3.4 Empirical testing

Empirical work on multimarket competition has used different measures of the multimarket contact construct, as shown in Table 2.4. The possible levels of multimarket contact measure are summarized in Table 2.5: *market level*, *firm-in-market level*, and *dyad level*. A *market level* of multimarket contact captures the level of multimarket contact among all incumbents in a market. Such a level of measure reflects the IO economics roots of the multimarket competition literature. IO economists have a deep-rooted interest in discovering whether concentration in a particular industry poses antitrust dangers to consumers (Scherer and Ross 1980). None of the studies use measures at this level of analysis because market-level multimarket contact is an industry- rather than a firm-level attribute.

Table 2.5 – Levels of Analysis of Multimarket Measures

Level	Notation	Definition	Cross-level relationship
Dyad level	MMC_{ijm}	Number of markets in which firms *i* and *j* meet outside focal market *m*	The most basic level
Firm-in-market level	MMC_{im}	Number of markets in which firm *i* meets all its competitors outside focal market *m*	The sum of dyad level across all markets outside focal market *m*
Market level	MMC_{m}	Number of markets in which all firms meet each other outside focal market *m*	The sum of dyad level across all firms and markets outside focal market *m*

Firm-in-market level of measure captures a focal firm's contact with all its rivals across all markets. This level of measure is suitable for studies of the competitive activity of firms within specific markets (Gimeno and Jeoung 2001). The majority of studies analyze the effects of multimarket contact at the firm-in-market level (Barnett 1993; Baum and Korn 1996; Boeker et al. 1997; Greve 2000, 2006; Haveman and Nonnemaker 2000; Stephan et al. 2003; Fuentelsaz and Gomez 2006). *Dyad level* of measures focuses on the competitive interaction between *two* firms, representing the most basic level of analysis (Gimeno and Jeoung 2001). Only two studies examine multimarket competition at this level: Baum and Korn (1999) and Korn and Baum (1999). Gimeno and Jeoung (2001) argue that the dyadic level may be more appropriate in examining actions that are dyadic in nature, such as attack against a specific rival.

Studies differ in how they capture the level of multimarket contact. In its most basic form, multimarket contact describes the *count of multimarket contacts* that a firm has with incumbents outside the focal market (Barnett 1993; Greve 2000, 2006), whereas some studies calculate the *percentage of multimarket contact*, i.e. the ratio of the count of multimarket contacts to the total number of markets in which they operate (Baum and Korn 1996; Boeker et al. 1997; Stephan et al. 2003; Fuentelsaz and Gomez 2006). To illustrate how the scaling occurs, suppose that a

potential entrant to a target market operates in 5 markets. If this potential entrant already encounters with one of the target market's incumbent in 3 markets, they have a multimarket contact of 60%. The level of multimarket contact would go down to 6% if the focal firm operates in 50 markets, and the count measure of multimarket contact would still be 3 in both situations.

According to the mutual forbearance logic, some contacts may be more important than others. Hence, some studies weigh the contacts according to their strategic importance in an attempt to model how managers weigh their market entry and exit decisions (e.g. Fuentelsaz and Gomez 2006). Yet Gimeno and Jeoung (2001) urge researchers to weigh their multimarket measures only when there are theoretical grounds, because the use of different scales and weights can alter the distribution of the measures.

Finally, in estimating the effect of multimarket contact on market entry and exit, studies have applied two different methodologies: logistic regression modeling (Boeker et al. 1997; Stephan et al. 2003) and event history analysis (Barnett 1993; Baum and Korn 1996, 1999; Korn and Baum 1999; Greve 2000, 2006; Haveman and Nonnemaker 2000; Fuentelsaz and Gomez 2006). The use of either methodology does not seem to impact the expected results since the inverted-U-shaped curve was found in studies using both types of methods. The differences and suitability of these methodologies are discussed in more detail in Chapter 5.

2.4 Behavioral antecedents of market entry and exit

Market entry and exit decisions are considered corporate strategic decisions and, as such, are in the realm of the most fundamental areas of inquiry in strategic management (Rumelt,

Schendel, & Teece, 1994). The behavioral perspective has been applied to the study of such decisions. Regarding market entry, Haleblian, Kim, Rajagopalan (2006), using a sample of U.S. commercial banking industry, found that acquisition performance positively influenced the likelihood of a firm's making a subsequent acquisition. Iyer and Miller (2008) examined the effect of performance relative to aspiration level – the attainment discrepancy (Lant, 1992) – and found that acquisition activity increases as performance rises among firms performing below aspiration level, but fall among firms performing above aspiration level in a sample of U.S. manufacturing firms.

Using different terms to define market exit (e.g. sell-offs, spin-offs, divestiture, divestment), many studies support a negative relationship between firm performance and exit, in that as firm performance decreases, the likelihood of exit increases (Montgomery and Thomas 1988; Ravenscraft and Scherer 1991; Chang 1996; Steiner 1997). The main rationale is that external pressures in the form of low company profits help break down the divestment barriers.

While some studies focus on the effect of firm performance, others look at both the business unit and firm performance levels. Some studies also analyze relative performance, that is to say, the business unit performance related to the core business performance or the core industry performance. For example, Duhaime and Grant (1984) found that low competitive and financial strength of the business unit relative to industry peers can trigger exit decisions, and Markides (1992) found that a firm is more likely to divest business units the higher the profitability and advertising intensity of its core industry. However, Cho and Cohen (1997) raise an important characteristic of the relationship between units. They argue that because of cross subsidization from profitable business units, firms do not sell off poorly performing business units until the firm experiences significant underperformance relative to its industry peers.

Current research on the relationship firm performance and market exit decisions pay now more attention to the interaction effects of performance and other independent variables. Sanders (2001), for example, defines firm performance as a situational characteristic that affects the divestiture decisions. Observing 250 firms from the Standard and Poor's 500 (S&P 500), he found that poor performance not only results in negatively framed decisions, but also increases the CEO's role in such negative outcomes. Shimizu and Hitt (2005) investigated factors that constrain and facilitate divestment of business units as performance decreases. They found that factors contributing to organizational inertia (e.g. size and age) delay the divestiture of poorly performing acquired units, but factors that decrease organizational inertia (e.g. new CEO) are found to accelerate the divestiture of poorly performing units. In a recent study, Shimizu (2007) proposes a multi-level model that integrates arguments from three distinct theories: prospect theory, behavioral theory of the firm and the threat-rigidity thesis. Studying the divestiture of formerly acquired units, he found that these decisions are influenced by psychological and organizational factors that increase or decrease the likelihood of divestiture as unit performance decreases.

2.5. Conclusion: Gaps in current research and opportunities for future research

In the next paragraphs, I identify gaps in prior research and explain how this dissertation seeks to address them.

2.5.1 Market entry and exit as changes in a firm's business scope

Across all corporate strategy studies reviewed, there is one recurring theme: entry and exit transactions involve change in ownership, that is to say, entry implies that firms are being

acquired and exit implies that business units are being sold, spun-off, or carved-out and assets are being transferred to new owners. Thus, the focus is more on the adjustment in ownership than the adjustment in the scope of the firm. Yet the central question posed by theoretical and empirical research in corporate level strategy is: "In what product markets and businesses should the firm compete?"

When focusing on ownership changes, one overlooks the possibility that changes in a firm's business portfolio may not involve transfer of ownership, as firms can enter into new markets or exit from markets by internally restructuring. For example, MBNA in England decided to withdraw from the consumer lending market, but it has not sold its business unit. Rather, it has internally restructured its operations by transferring 400 employees to other areas of the company (Gleeson 2007).

The conceptualization that closely approaches the idea of entry and exit decisions as changes in a firm's scope is the one adopted in multimarket studies (e.g. Baum and Korn 1996; Gimeno and Woo 1996). In this dissertation, every firm is conceived to occupy a *market domain*, defined as "the set of markets in which a firm operates" (Baum and Korn 1996, p. 256). This definition is aligned with D'Aveni's (2001, p. 4) definition of a firm's business portfolio as a "geo-product portfolio, consisting of geo-product markets". A company's geo-product portfolio represents "the company's position on the competitive space delineated by geographies and by the company's products and services" (D'Aveni 2001, p. 4). This definition of market provides a granular view of the changes in the scope of the firm in terms of product and geographic markets served. Consistent with this definition, *market entry* is defined as the inclusion of a new market into a firm's portfolio, regardless of how entry is pursued (e.g. acquisition or internal development),

and *market exit* is conceptualized as the withdrawal from a given market, regardless of how exit is pursued (e.g. sell-off, dissolution, internal restructuring, etc).

2.5.2 The overlooked argument in corporate strategy literature

Few strategic decisions draw so much attention from the corporate world and can have such an influence on a firm's success as corporate diversification decisions. Accordingly, the relationship between diversification and firm performance as well as the investigation of its antecedents are at the core of much of corporate strategy research (Palich, Cardinal, Miller, 2000).

In line with arguments first advanced by Penrose (1959) and Teece (1982), most research emphasizes the role of internal determinants of diversification, such as firm-specific resources and capabilities (e.g. Miller, 2004; Farjoun, 1998; Markides and Williamson 1996; Robins and Wiersema 1995). However, the influence of the competitive context on diversification decisions is also a noteworthy factor (Gimeno, Hoskisson, Beal, and Wan, 2005). For instance, profitability in a focal business depends not only on a firm's economies of scope, but also on its rivals' economies of scope and its competitive interaction with their rivals (Gimeno and Woo, 1999; Li and Greenwood, 2004). Hence, this dissertation seeks to fill this gap by focusing on the competitive antecedents of corporate strategic decisions.

2.5.3 A behavioral perspective of multimarket competition

Research in multimarket competition has been instrumental in bringing the competitive context into diversification and divestiture decisions. However, because of its IO roots,

multimarket research does not examine how changes in the risk preference of decision makers influence the competitive behavior of multimarket firms.

Except for a few studies that adopt a behavioral approach to multimarket competition (e.g. Greve 2000; Korn and Baum 1999; Stephan et al. 2003), the role of managers in multimarket competition has been largely ignored. For instance, Gimeno (2002) emphasizes that future research needs to investigate the antecedents and motivations to establish and expand multimarket contact. Korn and Rock (2001) are even more emphatic by saying that "in order to move multimarket theory forward, empirical work must begin to penetrate the "black box" of managerial decision-making in multi-market environments."

If the research objective is to explain and understand the actual behaviors of individual firms as they interact with competitors, a behavioral perspective of multimarket competition may have distinct advantages. Hence, I argue that multimarket competition research can be greatly enhanced if it incorporates the reality of bounded rationality of decision-makers. Predicting risk behavior according to firm performance and aspiration levels, the behavioral theory of the firm provides a natural contrast with the IO tradition and, therefore presents an opportunity to set out and test in the real world alternative hypotheses that are not fully consistent with each other.

Although the behavioral perspective has recently been applied to the study of corporate strategic decisions (e.g. Haleblian, Kim, Rajagopalan, 2006; Iyer and Miller, 2008), I propose a theoretical model that explicitly integrates behavioral and competitive perspectives to the study of market entry and decisions. My behavioral model of multimarket competition is presented in the next chapter.

CHAPTER 3 – THEORY DEVELOPMENT AND HYPOTHESES

This chapter develops a research framework for understanding the impact of behavioral contingencies on the mutual forbearance hypothesis, proposing a behavioral model of multimarket competition that focuses on market entry and exit behavior. It begins by describing the theoretical model, its elements and links. Next, I present the core constructs from the behavioral theory of the firm – firm performance and organizational slack – and how they impact risk behavior. Finally, I develop hypotheses for the impact of performance and organizational slack on the mutual forbearance hypotheses for market entry and market exit.

Figure 3.1 – Theoretical model: Elements and links

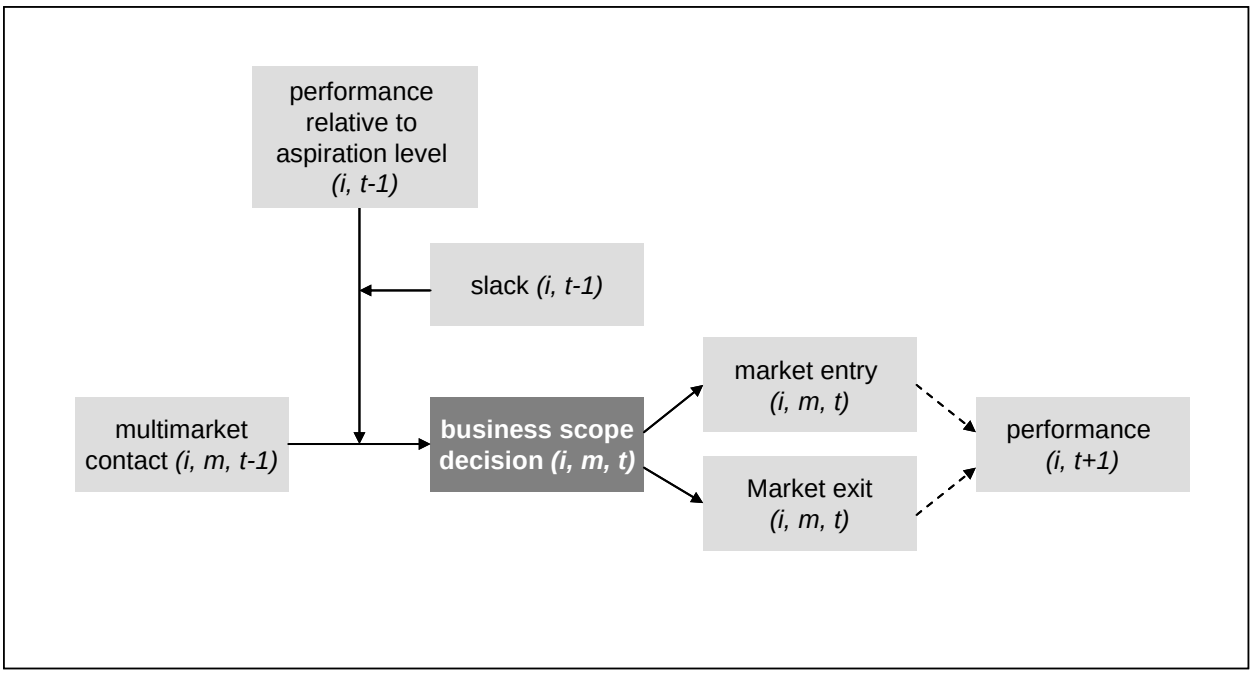


Figure 3.1 presents the elements and links of the theoretical model. The solid lines are the links explored in this dissertation, whereas the dashed lines are featured for completeness of the

model. The core element of the model is the scope decision with respect to market entry and exit. Firms expand and contract their scope according to the level of multimarket contact, performance relative to aspiration level, and organizational slack. The mutual forbearance logic focuses on the relationship between multimarket contact and scope decisions, and my dissertation examines the moderation effect of performance relative to aspiration level and organizational slack on that relationship. Although I acknowledge that market entry and exit subsequently impact firm's performance, I do not explore this relationship in my dissertation.

3.1 Performance relative to aspiration level, slack, and risk taking

The relationship of a firm's performance to its aspiration levels of performance functions as a "master switch" that affects a wide range of organizational behaviors (Greve, 2003). The behavioral theory of the firm predicts that when firm performance is above the aspiration level, increases in firm performance lead to decreases in risk taking (Cyert & March, 1963). While these effects have been supported empirically, the effects of performance below aspiration level still remain under debate (Wiseman & Bromiley, 1991; March & Shapira, 1987; Ocasio 1995). The behavioral theory predicts that when firm performance is below aspiration level, decreases in firm performance lead to increases in risk taking (Cyert and March 1963). In contrast, some researchers argue that performance below aspiration level is perceived as a threat, and that such a perception makes decision makers rigid and unable to generate risky courses of action (Staw, Sandelands, Dutton, 1981) – the so-called *threat-rigidity thesis*. In other words, low performance induces risk aversion.

Attempting to reconcile these conflicting predictions for performance below aspiration level, March and Shapira (1987, 1992) propose a model of risk taking that considers shifts in focus of

attention by managers. As they put it, "understanding action in the face of incomplete information may depend more on ideas about attention than on ideas about decision (p. 1412)." Building upon a large body of literature in psychology of risk taking (e.g. Atkinson 1954; Lopes 1987) and decision theory (e.g. Tversky 1972), they contend that risk preference varies with context, which is highly subject to managerial interpretation. Their model is based on two reference points: the aspiration level and the survival level. They propose that managers first attend to the level of performance relative to the aspiration level, or the attainment discrepancy (Lant 1992). When performance is above aspiration level, managers are more likely to be risk averse, which is consistent with the behavioral theory. However, when performance is below aspiration level, managers will be either risk averse or risk seekers according to the survival level, which is the point at which a firm's resources are exhausted. If the current performance is below aspiration level but well above the survival point, the opportunities to fill the gap between a low performance and the aspiration level are more salient than the dangers associated with risk taking. Thus, decreases in performance lead to risk taking, which is again consistent with the behavioral theory. On the other hand, when current performance is close to the survival point, the dangers associated with risk taking become more salient than its opportunities, preventing managers from pursuing risk. Thus, decreases in performance lead to risk aversion, which is consistent with the threat-rigidity thesis (Staw et al. 1981).

The rules that govern the shift in the focus of attention between a survival point and an aspiration level are an important aspect of the model. March and Shapira (1992) suggest that slack resources can be drivers of focusing attention on the opportunities rather than on the dangers. Large organizational slack lowers the survival point, whereas low slack raises it. Hence, the distance between the aspiration level and the survival point for firms with large

organizational slack is greater than the distance for firms with low organizational slack. Consequently, managers in resource-rich firms are more likely to perceive performance below aspiration level as a repairable gap; therefore, in such conditions, performance below aspiration level increases risk taking, which would be predicted by the behavioral theory of the firm (Cyert and March 1963). Conversely, managers in resource-poor firms perceive low performance as a threat to firm survival (Audia & Greve, 2006), thus inducing risk aversion, which would be predicted by the threat-rigidity hypothesis (Staw et al. 1981).

In sum, the literature allows us to make predictions for each of the performance/slack categories: (a) firm performance below their aspiration level and high slack, (b) firm performance below their aspiration level and low slack (c) firm performance above aspiration level. In the following sections, I integrate the behavioral theory of the firm into the multimarket theory, proposing a behavioral model of multimarket competition that focuses on market entry and exit behavior.

3.2 Market Entry

Considered a strategic move, market entry is a risky decision, since it requires substantial resource commitment and is more difficult to reverse (Chen and MacMillan 1992; Miller and Chen 1994; Smith, Grimm, Gannon, and Chen 1991). In this section, I first present the mutual forbearance null hypothesis for market entry in order to make the theoretical model complete, and then develop three hypotheses. Each hypothesis addresses one of the possible performance/slack categories: performance below aspiration level and high slack, performance below aspiration level and low slack, performance above aspiration level, irrespective of slack resources.

3.2.1 The mutual forbearance null hypothesis for market entry

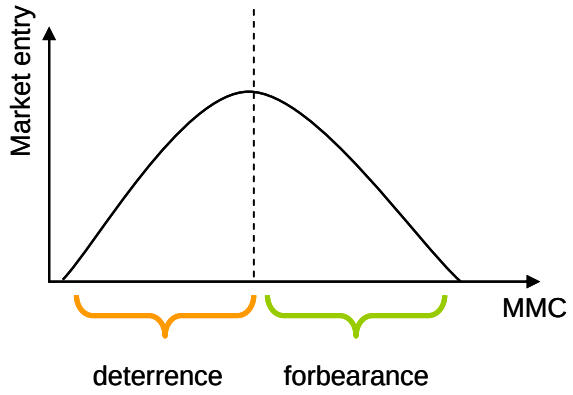
The Industrial Organization perspective assumes that firms maximize a profit function while taking into account the likely strategies of rivals (Scherer and Ross, 1980). If they are at all perceptive, firms recognize that their pricing decisions are interdependent and their profits are higher when they coordinate their prices than when they pursue their own self-interest (Tirole, 1988). Consequently, firms are motivated to engage in joint-profit maximizing strategies through mutual forbearance (Bernheim and Whinston, 1990). In terms of risk preference, the mutual forbearance logic suggests that a firm's risk preference varies with its level of interdependence with rivals or the competitive context in which the firm is embedded. At low levels of multimarket contact, the threat of retaliation by rivals is minimal. Consequently, firms are motivated to pursue risk. However, as the interdependence increases, firms change their risk preference and avoid risk, thus forbearing from rivalry. Thus, the mutual forbearance logic applied to market entry decisions assume that firms enter new markets at low levels of multimarket contact. In order words, there is a negative relationship between multimarket contact and risk preference.

This theoretical logic has been primarily built on the forbearance effect that is created once multimarket contact levels are high. However, to create this deterrence capability, firms must establish multimarket contact with their rivals (Korn and Baum, 1999). Hence, in the context of market entry decisions, the recent mutual forbearance logic that emerges from empirical studies proposes an inverted-U relationship between multimarket contact on one hand, and risk preference with respect to market entry on the other (Baum and Korn, 1999; Haveman and

Nonnemaker, 2000; Stephan et al., 2003; Fuentelsaz and Gomez, 2006). This relationship is depicted in Figure 3.2 and set out as the mutual forbearance null hypothesis for market entry:

> *Hypothesis 0a (H0a): There will be an inverted-U-shaped relationship between a firm's level of multimarket contact with its rivals and a firm's rate of market entry.*

Figure 3.2 – The Mutual Forbearance Null Hypothesis for Market Entry



The two parts of the curve describe the two sides of competitive interaction: the creation of deterrence capability and the operation of forbearance. The inflection point indicates the threshold of multimarket contact at which risk preference shifts from risk seeking to risk avoidance: Below the threshold, firms are likely to pursue risk, and above the threshold, they are likely to avoid risk. From an IO standpoint, this curve also represents the best combination of risk avoidance and risk seeking behaviors that lead to maximization of profits (Edwards, 1955). The IO logic assumes that firms abiding by the tacit agreements with rivals benefit from decreased rivalry and, consequently accrue greater profitability (Porter, 1980).

To integrate the behavioral logic into the forbearance logic I articulate how the three predictions for performance relative to aspiration level impact the mutual forbearance logic (i.e. the mutual forbearance null hypothesis). I develop three hypotheses that demonstrate how firm performance feedback moderates the relationship between multimarket contact and market entry decisions. An illustration of the hypothesized effects is provided in Figure 3.3. The mutual forbearance null hypothesis (H0a) is represented as the dashed curve. The moderating effect of performance relative to aspiration level and slack is represented as the skewed curve. The skewed curves depict the competitive interactions after the introduction of bounded rationality into the rational logic of the mutual forbearance hypothesis.

3.2.2 Performance below aspiration level and high slack

Abundant-slack firms performing below aspiration level are likely to take more risks than limited-slack firms (March and Shapira, 1987, 1992). In taking more risks, they will consider alternative strategies (Zajac, Kraatz, and Bresser, 2000) in order to reduce or eliminate the discrepancy between current performance and the aspiration level. Indeed, evidence suggests that performance below aspiration levels has been related to larger magnitude of strategic changes (Miller & Chen 1994; Zajac & Kraatz, 1993; Audia, Locke, and Smith, 2000).

Taken together, these findings suggest that low-performing firms with high slack display high tolerance to risk. Risky alternatives become more acceptable because the decision-maker is now in the loss domain (Kahneman and Tversky, 1979). This suggests that poor-performing multimarket firms with abundant slack will escalate the competition to higher levels. Hence, they may take longer to forbear, because they will not be as much concerned with maintaining the competitive equilibrium as they are with recovering from the shortfall. However, as rivals start

retaliating to this excessively aggressive behavior, the aggressive firms will tend to forbear from further market entry, and again abide by the mutual interdependencies that their multimarket ties represent. In sum, the interaction between performance below aspiration level and high slack moderates the relationship between multimarket contact and market entry as it exacerbates the expansionist motivation and pushes the threshold away from the point where it would be under normal conditions. This relationship is depicted in Figure 3.3(a) and stated in H1a:

> *Hypothesis 1 (H1a): The impact of a firm's level of multimarket contact with its rivals on the firm's rate of market entry will be* ***amplified*** *when the firm's performance is below the aspiration level and its level of slack resources is high.*

3.2.3 Firm performance below aspiration level and low slack

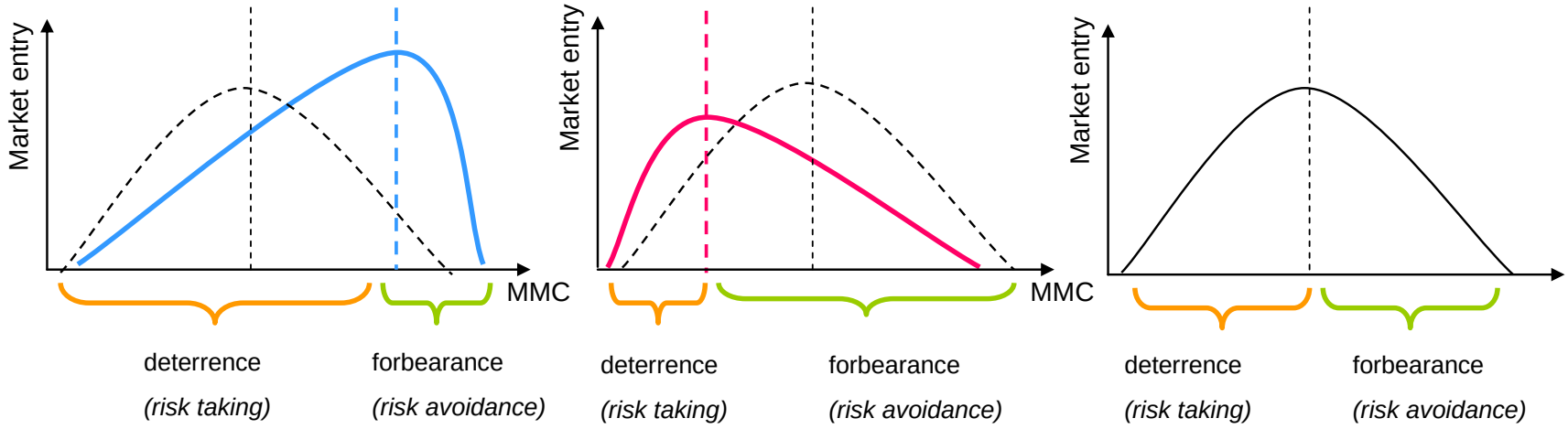
Contrary to resource-rich firms, resource-poor firms performing below aspiration level will be risk-averse (Audia and Greve, 2006). A threat to survival results in restriction of information and rigidity in strategic action (Staw et al., 1981). This suggests that low-performing, resource-poor firms will pursue market entry very cautiously. First, those firms do not have slack resources to enter into markets in order to create deterrence. Second, under conditions of adversity, low-slack firms shift their focus of attention to the firm's internal activities (Hambrick and D'Aveni, 1988). Consequently, they start forbearing sooner than they would under normal conditions. In sum, the interaction between performance below aspiration level and limited slack moderates the relationship between multimarket contact and market entry as it diminishes the expansionist motivation and moves the threshold to the left from the point where it should be under normal conditions. This relationship is depicted in Figure 3.3(b) and stated in H2a:

Figure 3.3 – Market Entry and the Moderating Effects of Firm Performance and Organizational Slack

(a) Performance below aspiration level, high slack

(b) Performance below aspiration level, low slack

(c) Performance above aspiration level



Hypothesis 2a (H2a): The impact of a firm's level of multimarket contact with its rivals on the firm's rate of market entry will be ***attenuated*** *when firm performance is below the aspiration level and its level of slack resources is limited.*

3.2.4 Firm performance above aspiration level

Change is less likely to occur when the organization performs above the aspiration level (Cyert and March, 1963). Studies have found that good past performance induces firms to carry competitive repertoires characterized as having high levels of inertia (Miller and Chen, 1994) and that financially successful firms are less likely to respond to competitive challenges (Hambrick, Cho, and Chen, 1996). Taken together, these findings suggest that high performing firms seek stability in competitive practices. Although the rational view of mutual forbearance suggests that firms coordinate their actions in order to maximize profits, from a behavioral perspective, firms avoid uncertainty in order to obtain profits that satisfies the dominant coalition (Cyert and March, 1963). The goal is to seek ways to make an uncertain environment predictable. For example, firms enter markets of known competitors because they allow managers to draw on their past experience regarding the competitive responses of better-known rivals (Stephen et al., 2003).

High performing firms also tend to display recurring competitive patterns since success reinforces past strategic decisions (Levitt and March, 1988). Hence, they are also less willing to abandon the multimarket strategy that generated the performance in the first place (Greve, 1998). Risk avoidance in this context means that high-performing firms have fewer incentives to disrupt the tacit agreements that the multimarket structures represent. Indeed, multimarket contact always facilitates collusion when firms' objectives are concave, that is to say when firms are risk

averse (Spagnolo, 1999). Thus, because performance goals are satisfied, firms can attend to competitive goals and abide by the focus on performance above aspiration level does not trigger problemistic search (Cyert and March, 1963), and consequently, does not moderate the relationship between multimarket contact and market entry rates. This relationship is depicted in Figure 3.3(c) and stated in H3a:

> *Hypothesis 3a (H3a): Performance above aspiration does not moderate the inverted-U-shaped relationship between a firm's level of multimarket contact with its rivals and a firm's rate of market entry.*

3.3 Market Exit

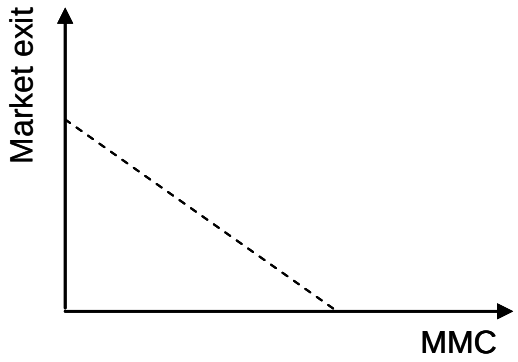
One of the most understudied behaviors in competitive dynamics is exit. Generally speaking, if the assumptions of multimarket competition are valid, then they will be exhibited in exit decisions similarly to entry decisions. Furthermore, the impact of performance relative to aspiration level should also be seen in exit patterns.

In this section, I develop hypotheses regarding the moderating effect of firm performance and organizational slack on market exit behavior. I first present the mutual forbearance null hypothesis with respect to exit in order to make the theoretical model complete, and then develop three hypotheses. Each hypothesis addresses one of the possible performance/organizational slack categories: performance below aspiration level and high slack, performance below aspiration level and low slack, and performance above aspiration level.

3.3.1 The mutual forbearance null hypothesis for market exit

The relationship between multimarket contact and market exit behavior is shown in Figure 3.4, representing the empirical evidence that firms are sensitive to their level of multimarket contact with competitors when making market exit decisions (Baum and Korn 1996, Boeker et al. 1997).

Figure 3.4 – The mutual forbearance null hypothesis for market exit



At low levels of multimarket contact with its competitors in a focal market, a focal firm does not have an extended interdependence with them. Thus, when contemplating market exit, firms opt to exit markets that do not provide a credible deterrent to rivals, because presence in such markets does not enable firms to signal their ability to respond to future aggressions (Edwards 1955). However, as multimarket contact reaches higher levels, the motivation to exit from markets is likely to decline. First, firms with a high level of multimarket contact with rivals have the ability to signal deterrence. For instance, Gimeno (1999) found that airlines use a relatively small presence in their rivals' hubs to reduce the competitive intensity of these rivals in their own hub. As a result, maintaining footholds in markets with high multimarket contact leads to stable market shares (Heggestad and Rhoades 1978) and reduced levels of competition in individual markets (Scott 1982). Accordingly, all studies examining the relationship between multimarket

contact and market exit decisions (Barnett 1993; Baum and Korn 1996, 1999; Boeker et al. 1997) found that higher levels of multimarket contact are associated with lower exit rates.

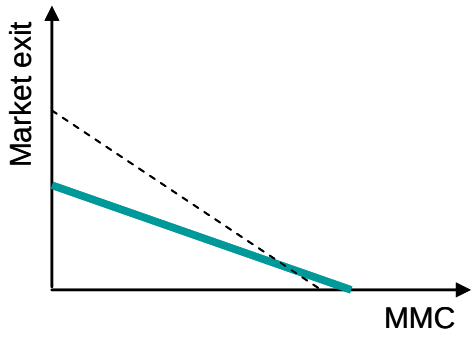
Another aspect that contributes to lower exit rates is the fact that the prolonged presence in markets with high multimarket contact may considerably raise exit barriers (Porter 1980). Indeed, businesses which are of high strategic importance are difficult to be divested due to the value created by non-capital investments (Harrigan 1980). Moreover, even if these markets do not yield profitable margins, firms are unlikely to abandon them because of the cross-subsidization from profitable markets (Cho and Cohen 1997). The rationale behind a firm's keeping footholds in markets with high multimarket contact is that the costs incurred in such activity are justifiable, because decreased levels of rivalry lead to performance levels that would be lower otherwise (Hughes & Oughton 1993; Evans & Kessides 1994; Jans & Rosenbaum 1996; Gimeno and Woo 1999). Thus, the arguments above can be summarized as the mutual forbearance null hypothesis for market exit:

> *Hypothesis 0b (H0b): There is a negative relationship between a firm's level of multimarket contact with market incumbents and a firm's rate of market exit, such that firms with higher levels of multimarket contact with incumbents in a focal market are less likely to exit that market than firms with lower levels of multimarket contact.*

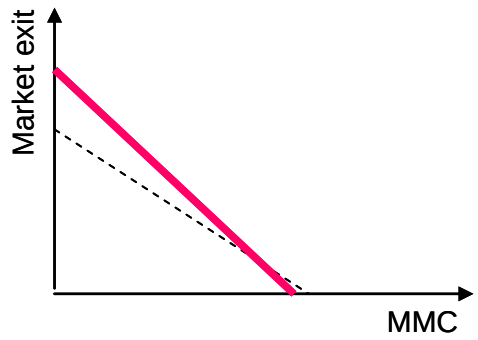
In the next paragraphs, I develop hypotheses addressing the moderating effect of firm performance and slack on the relationship between multimarket contact and market exit. An illustration of the hypothesized effects is shown in Figure 3.5.

Figure 3.5 – Market Exit and the Moderating Effects of Firm Performance and Organizational Slack

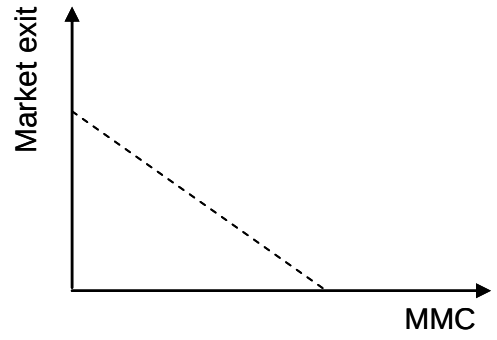
(a) Performance below aspiration level, high slack



(b) Performance below aspiration level, low slack



(c) Performance above aspiration level



3.3.2 Firm performance below aspiration level and high slack

According to the March-Shapira model (1992), the effects of performance below aspiration level on risk taking differ depending on the level of organizational slack, in that high-resource firms are risk-seekers, and low-resource firms are risk averse (Audia and Greve 2006). In the context of market exit decisions, the decision to remain in a market is riskier than the decision to exit from it (Shimizu 2007). Hence, high-resource firms performing below aspiration level have incentives to remain rather than withdraw from markets. Not surprisingly, high-resource firms divest not as often as low-resource firms when faced with the same performance gap (Chang 1996). Accordingly, research has found that high-resource firms are more likely to cut capacity incrementally (Lieberman 1990), and also likely to hold physical assets idle but ready to resume, a situation that affords recuperative flexibility that discourages competitor entry or expansion (Harrigan 1985). These findings have implications for the expected market exit behavior under the mutual forbearance null hypothesis.

According to the mutual forbearance null hypothesis, firms with low levels of multimarket contact firms are more likely to exit from markets than firms with high levels of multimarket contact (Baum and Korn 1996; Boeker et al. 1997). However, an increased propensity to take risk is translated into a greater need to show deterrence capability, meaning that high-resource, low-performing firms are less likely to exit from markets. Thus, the negative relationship between multimarket contact and market exit rates is moderated by below-aspiration firm performance and large slack. This relationship is depicted in Figure 3.5(a) and stated in *Hypothesis 1b (H1b):*

The impact of a firm's level of multimarket contact with market incumbents on the firm's rate of market exit will be ***attenuated*** *when firm performance is below the aspiration level and its level of slack is high*

3.3.3 Firm performance below aspiration level and low slack

Contrary to high-resource firms, low-resource firms performing below aspiration level are risk averse (March-Shapira 1992). Excessive pools of financial and managerial resources may insulate high-resource firms from pressures to exit from current markets, but low-resource firms are unable to buffer these pressures (Shimizu and Hitt 2005). Hence, as firm performance decreases, the likelihood of exit increases (Duhaime and Grant 1984; Montgomery and Thomas 1988; Ravenscraft and Scherer 1991; Chang 1996; Steiner 1997).

Low-resource firms liquidate and divest more subunits to generate cash (D'Aveni 1989), since they interpret decreases in performance as a threat to survival rather than a repairable gap (Audia and Greve 2006). Fombrun and Ginsberg (1990) suggest another incentive for low-resource firms to exit from markets. They noted that, although entry into other markets may not be an available option for many poor performing firms, the exit option does not require such capital investment. Hence, poorly performing firms may try to correct the problems by divesting underperforming businesses without necessarily moving into new ones (Chang 1996).

Taken together, these ideas suggest that low-performing firms with limited resources pursue market exit more vigorously than low-performing firms with abundant slack do. Furthermore, since the exit process involves stages and complexities that create great potential for experience and learning curve benefits (Lieberman 1987, 1989), low-resource firms gain experience with sell-offs and divestitures. Consequently, they will continue to use them (Bergh and Lim 2008).

Yet they maintain footholds in some markets. When faced with increasing uncertainty, corporate-level managers are pressured to direct their resources toward the individual business lines they understand best (Jones & Hill, 1988). Hence, peripheral markets would receive less attention and preference than core markets (Bergh 1998). By extension, as low-slack firms are risk averse, they prefer to remain in core markets such as markets with high levels of multimarket contact, since the potential for deterrence is higher in such markets (Baum and Korn 1996). These arguments suggest that the negative relationship between multimarket contact and market exit rates is moderated by below-aspiration firm performance and low slack. This relationship is depicted in Figure 3.5(b) and set out as Hypothesis *2b:*

Hypothesis 2b (H2b): The impact of a firm's level of multimarket contact with market incumbents on the firm's rate of market exit will be amplified when the firm's performance is below the aspiration level and its level of slack resources is limited

3.3.4 Firm performance above aspiration level

As predicted by the behavioral theory of the firm, risk taking is less likely when firms perform above aspiration level (Cyert & March 1963). High performing firms also tend to display recurring competitive patterns because success reinforces past strategic decisions (March and Levitt 1988) and induces firms to carry competitive repertoires characterized as having high levels of inertia (Miller and Chen 1994). Being risk averse, high-performing firms are more likely to maintain footholds in 'safe' markets: markets with high levels of multimarket contact, due to high-performing firms' ability to signal deterrence to rivals. This rationale is similar to the mutual forbearance null hypothesis which predicts that firms are less likely to remain in markets

with low levels of multimarket contact, but more likely to remain in markets with high levels (Barnett 1993; Baum and Korn 1996, Boeker et al. 1997).

Risk avoidance also means that high-performing firms have fewer incentives to disrupt the tacit agreements that the multimarket structures represent. Accordingly, Spagnolo (1999) found that multimarket contact always facilitates collusion when firms' objectives are concave, that is to say when firms are risk averse. Hence, high performing firms are likely to display a competitive behavior that resembles the one predicted by the mutual forbearance null hypothesis. Thus, performance above aspiration level regardless of the level of slack does not appear to affect the relationship between multimarket contact and market exit. This relationship is depicted in Figure 3.5(c) and set out as Hypothesis 3b:

> *Hypothesis 3b (H3b): Performance above aspiration does not moderate the negative relationship between a firm's level of multimarket contact with market incumbents and a firm's rate of market exit.*

3.4 Conclusion

In my dissertation I integrate the behavioral theory of the firm into the multimarket theory, proposing a behavioral model of multimarket competition that focuses on market entry and exit behaviors. Table 3.1 provides a summary of the hypotheses. I argue that the relationship between multimarket contact and market entry and exit behavior is influenced by performance relative to aspiration level and the level of slack resources, and then make predictions for each of the performance/slack categories as follows.

For performance below aspiration level and high slack, I hypothesize that their interaction amplifies the effect of multimarket contact on market entry rates, but attenuates the effect of

multimarket contact on market exit. For performance below aspiration level and low slack, I hypothesize that their interaction attenuates the effect of multimarket contact on market entry, but amplifies the effect on market exit. Finally, I hypothesize that performance above aspiration level does not moderate either the relationship between multimarket contact and market entry, or the relationship between multimarket contact and market exit.

Table 3.1 – Summary of hypotheses

Moderators	Market Entry	Market Exit
Null hypothesis (baseline model)	H0a: There will be an inverted-U-shaped relationship between a firm's level of multimarket contact with its rivals and a firm's rate of market entry	H0b: There is a negative relationship between a firm's level of multimarket contact with market incumbents and a firm's rate of market exit
Performance below aspiration level and high slack	H1a: The impact of a firm's level of multimarket contact with its rivals on the firm's rate of market entry will be amplified when the firm's performance is below the aspiration level and its level of slack resources is high	H1b: The impact of a firm's level of multimarket contact with market incumbents on the firm's rate of market exit will be attenuated when firm performance is below the aspiration level and its level of slack resources is high
Performance below aspiration level and low slack	H2a: The impact of a firm's level of multimarket contact with its rivals on the firm's rate of market entry will be attenuated when firm performance is below the aspiration level and its level of slack resources is limited	H2b: The impact of a firm's level of multimarket contact with market incumbents on the firm's rate of market exit will be amplified when the firm's performance is below the aspiration level and its level of slack resources is limited
Performance above aspiration level, irrespective of the level of slack resources	H3a: Performance above aspiration does not moderate the inverted-U-shaped relationship between a firm's level of multimarket contact with its rivals and a firm's rate of market entry	H3b: Performance above aspiration does not moderate the negative relationship between a firm's level of multimarket contact with market incumbents and a firm's rate of market exit

CHAPTER 4 – RESEARCH CONTEXT

The previous chapter proposes a theoretical model of behavioral boundary conditions for the mutual forbearance hypothesis regarding market entry and exit. In this chapter I describe the contextual setting in which the theoretical model will be tested. First, I present the research requirements and challenges for testing the theoretical model. Next, I explain why the U.S. property and liability insurance industry is an appropriate empirical setting, and concluding the chapter, I provide a brief description of the industry.

4.1 Selecting a contextual setting for empirical analysis

4.1.1 Research requirements

To ensure that the empirical results of the study have statistical validity, I must select an empirical setting in which the conditions for multimarket competition are more likely to be satisfied. First, the empirical setting must be characterized by *multimarket firms*, that is to say, firms operating in several market segments. Another condition is *extended interdependence between competitors*, which occurs as firms encounter the same competitors across multiple markets. This condition is crucial as it facilitates forbearance behavior, when firms tacitly coordinate their competitive actions in order to achieve decreased rivalry and, consequently, enhanced performance. Moreover, the testing of the model also requires *longitudinal data* because the recognition of extended interdependence arises as a result of repeated interaction over time.

One of the assumptions of the theoretical model is that intensity of rivalry is not a quality of industry structure but varies from market to market according to the set of competitors operating

in each specific market. Because the source of competition for a firm within a market must be the set of competitors in that market, the empirical setting must be characterized by *no cross-elasticity across markets* (i.e. products or services offered to different markets are not close substitutes), and by *homogenous products or services* (i.e. firms competing with little differentiation). Moreover, *clearly delimited market boundaries* facilitate the identification of incumbents and potential entrants to a given market. Since the dissertation focus is on a specific competitive behavior – market entry and exit decisions – it is equally important that the empirical setting be characterized by *market entry and exit activity*. The empirical setting must have intrafirm coordination mechanisms that enable firms to recognize the level of multimarket contact with their rivals and act accordingly (Golden and Ma 2003; Jayachandran et al 1999).

According to Gimeno and Woo (1999), multimarket competition theory may be most relevant under conditions of resource sharing among market units and under conditions of related diversification or geographic expansion. Hence, empirical analysis of product or geographic diversification within a *single industry* seems warranted. Indeed, Stephan et al. (2003) caution that inflection points, i.e. the point at which the relationship between multimarket contact levels and the rate of competitive entry switches from a positive one to a negative one, are likely to be unique to each industry.

Heterogeneity in the dependent and independent variables is also a necessary condition. Because the model predicts relationships between continuous variables, the empirical context must provide enough variance in multimarket contact (e.g. from low to high levels), competitive behavior (e.g. from mild to intense entry and exit activity), as well as variance in firm performance and slack.

In sum, the empirical context for testing the theoretical model must satisfy the following conditions: multimarket firms, interdependence between competitors, internal coordination mechanisms, longitudinal data, no cross-elasticity across markets, homogenous products, clearly delimited market boundaries, market entry and exit activity, single industry, and heterogeneity in the dependent and independent variables.

4.1.2 The U.S. property and liability insurance industry

The U.S. property and liability insurance industry offers an appropriate research context for empirical analysis of this dissertation's theoretical model, since it satisfies all conditions above mentioned. First, the property-liability insurance industry is characterized by *multimarket firms*, selling several insurance products and operating across a few or several states. *Extended interdependence* becomes characteristic of this industry because insurers are likely to encounter the same competitors in several product and geographic markets in which they operate. Consequently, their fortunes are interrelated.

The condition that *market boundaries must be clearly delimited* is attained as market segments can be either geographic (the 50 states and D.C.) or product markets (lines of businesses such as personal auto and homeowners insurance). In prior empirical studies on multimarket competition, researchers have investigated mutual forbearance in *one-dimensional* markets – either geographic (e.g. airlines city-pair routes) or product markets (e.g. hospital services). The U.S. insurance industry offers the opportunity to examine multimarket competition across *two-dimensional* markets, i.e. *geo-product markets* (D'Aveni 2001).

Despite being regulated, the property-liability insurance industry possesses the structural characteristics normally associated with the idealized competitive market: a large number of

firms, operating in markets with low concentration levels, and selling essentially identical products in some lines of business (Joskow 1973). Moreover, entry and exit barriers appear to be low as the capital requirements of a company seeking to become incorporated or enter a state where it has not been licensed previously are not very high. For example, state fixed minimum capital requirements average in the area of $2 million, which most insurers easily meet (Best's Review 2007). Thus, *market entry* and *exit activity* is found in this industry. Moreover, because these decisions define a firm's scope, they are centralized at the corporate level. Thus, the condition of internal coordination is satisfied.

The *single industry condition* is also satisfied as the insurance industry provides opportunity for related product and geographic diversification to be examined. Expectations for economies of scope in the insurance industry are largely attributable to the ability to cross-sell products, generate cost savings, create hybrid products, enhance brand image, and develop new sales channels.

In the property-liability insurance industry, there is *no cross-elasticity across markets,* since products serve particular needs and are not close substitutes. For instance, homeowners insurance is not a substitute for personal auto insurance. Moreover, *product homogeneity* is also present in this industry. The product itself – the policy – is essentially identical from company to company within a market since most policy forms are mandated by state law. Indeed, many customers view insurance products as commodities for which price matters more than service (A. M. Best, 2007).

Heterogeneity in the dependent and independent variables is another condition satisfied with this industry as the property-liability segment provides a diverse context for research, with firms of all sizes and performance levels. Also, because of the multitude of product and geographic

markets, the industry is characterized by firms with different levels of contact and entailing different market entry and exit patterns. Finally, since every insurer operating in the U.S. needs to comply with filing regulations, the quality of data is very high and *longitudinal data* at the most disaggregated level are available.

Although the theoretical model of this dissertation does not establish whether it assumes full or imperfect observability (Matsushima 2001), this study provides a strong test of mutual forbearance under conditions of imperfect observability, since information about prices and quality is not readily available (Greve 2008b).

4.2 The U.S property and liability insurance industry

4.2.1 Industry overview

The insurance mechanism focuses primarily on uncertainty regarding the chance that a particular loss will occur (Joskow 1973). From a business perspective, the costs associated with uncertainty can discourage business growth, whereas from a customer perspective, uncertainty over the financial consequences of loss to homes or autos can affect spending levels. Thus, by transferring the potential financial consequences of their loss exposures to an insurer, businesses and individuals can minimize the effects of uncertainty. Not surprisingly, the products sold by the insurance industry are purchased by virtually all economic agents in the U.S. economy.

The insurance industry constitutes a large part of the financial services sector in the U.S., providing nearly some 2.3 million jobs, or 2.1 percent of U.S. employment. Insurers also contribute more than $250 billion to the nation's gross domestic product (Insurance Information Institute 2006).

The insurance industry in the U.S. is divided into two broad categories, life insurance and property-liability insurance. Property-liability insurance, which is the focus of this dissertation, covers direct losses from damage to property, indirect losses resulting from direct losses (e.g., loss of income from damages to a business facility), and loss of possession. Coverage is provided to both personal and commercial customers; the former include individuals, and the latter, business policyholders.

The property and liability insurance industry has grown significantly over the last 30 years. Table 4.1 provides historical trends of the property-liability insurance industry. Between 1970 and 2005, the assets of property-liability insurers increased from $55 billion to $1.4 trillion. At the same time, total premium increased from $36 billion to $475 billion. In terms of profitability, insurers have experienced 'good' years (e.g. 13.1 percent in 1980) and 'bad' years (i.e. 6.8 percent in 2000).

Table 4.1 – Property and Liability Insurance Trends

	1970	1980	1990	2000	2005
Assets ($M)	55	198	556	1,034	1,398
Premiums Written ($M)	36,524	108,745	252,991	341,590	475,200
Return (%)	11.6	13.1	8.5	6.8	10.4
Number of firms	2,800	2,953	3,899	3,215	2,700

Source: A.M. Best and Insurance Information Institute

The number of firms in the industry consistently increased between 1970 and 1990. However, it began to drop in the 1990s, as the industry experienced a wave of mergers and acquisitions (M&As). The M&A wave was driven in part by advances in technology (Graham, Loftin, Xie, and Xiaoying, 2007), but the wave also coincides with a period of relative prosperity in the industry, which experienced high capitalization and low leverage during most of the period

(Cummins and Xie 2008). The industry is still characterized by a significant number of small insurers selling insurance products in limited geographic areas, but the top 200 insurers in the industry write 95% of the premiums in the property-liability insurance (Best's Review 2007).

Although the insurance business is associated with increased financial risk – both impairment and insolvency (the insurance's world equivalent of bankruptcy) have been relatively rare. Figure 4.1 shows the frequency of insurer impairment over the 1976-2005 period. Average annual rates of impairment were about one in 120 companies. The dominant causes of impairment have remained constant for over 30 years: deficient loss reserves, inadequate pricing, and rapid growth (A.M. Best Special Report 2006).

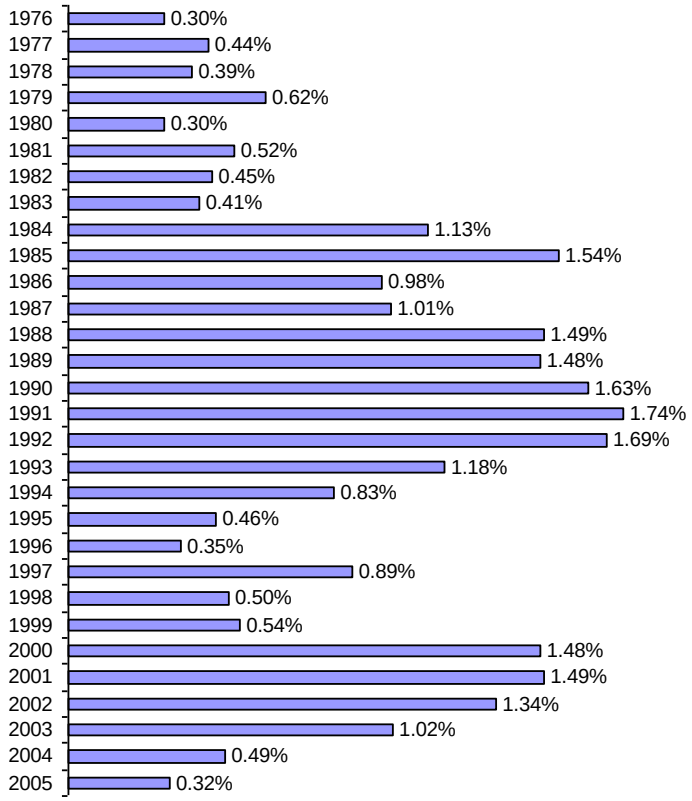


Figure 4.1 – U.S. Property-Liability Insurers, Annual Impairment Rate, 1976-2005

Source: A.M. Best, 2007, *The guide to understanding the insurance industry*.

4.2.2 Property liability insurance products

The property-liability insurance industry encompasses several lines of business: homeowners, personal auto, commercial auto, fire and allied, commercial multiple peril, farmowners multiple peril, ocean marine, inland marine, financial and mortgage guaranty, surety and fidelity, medical malpractice, workers' compensation, group accident and health, general liability, theft, boiler and machinery, and other miscellaneous property/casualty.

Table 4.2 shows the structure of the property-liability insurance in 2007. Premiums written (PW) represent the revenues for insurance companies. Although consisting of several business lines, the property-liability insurance industry has an uneven distribution of revenues across markets.

Table 4.2 – Premiums Written by Business Line in 2007

Business Line	PW ($M)	% Total PW	Loss Ratio	% M.S. Top 2 Writers	% M.S. Top 10 Writers	Leading Writer	% M.S.	% Writer's Total PW	2nd Leading Writer	% M.S.	% Writer's Total PW
Personal Auto	162	33.2%	64	28.9%	60%	State Farm	17.5%	34.6%	Allstate	11.3%	37.0%
Homeowners	63	13.0%	51	33.0%	64%	State Farm	21.7%	28.8%	Allstate	11.3%	11.3%
Other Liability	52	10.7%	52	26.0%		AIG	19.2%	31.5%	Zurich	6.8%	27.3%
Worker's Compensation	50	10.2%	62	23.6%	53%	AIG	12.4%	19.5%	Liberty Mutual	11.2%	28.0%
Commercial Multiple Peril	35	7.2%	41	15.0%	48%	Travelers	9.1%	14.6%	Hartford	5.9%	18.2%
Commercial Auto	29	5.9%	54	14.0%		Travelers	7.7%	7.6%	Progressive	6.5%	13.5%
Inland Marine	14	3.0%	36	17.5%		CNA	9.0%	14.9%	AIG	8.5%	3.9%
Fire	11	2.3%	32	25.3%		AIG	16.7%	5.9%	Assurant Solutions	8.6%	30.8%
Allied	11	2.2%	36	27.5%		Citizens	18.5%	53.4%	AIG	9.0%	3.0%
Medical Malpractice	10	2.1%	39	14.3%	42%	Berkshire Hathaway	7.4%	5.0%	AIG	6.9%	2.2%
Multiple Peril Crop	7	1.4%	57	33.8%		Ace INA	17.1%	14.9%	Centurion	16.7%	99.7%
Mortgage Guaranty	6	1.2%	95	41.6%		Mortgage Guar	24.6%	100.0%	Radian	17.0%	84.2%
Surety	5	1.1%	18	27.3%		Travelers	18.9%	4.6%	Zurich	8.4%	3.4%
Product Liability	4	0.8%	37	20.7%		AIG	12.3%	1.5%	Zurich	8.4%	2.5%
Group Accident and Health	3	0.7%	57	36.6%		AIG	27.1%	3.0%	Federated Mutual	9.5%	28.0%
Ocean Marine	3	0.6%	46	22.9%		AIG	13.2%	1.3%	Travelers	9.7%	1.4%
Financial Guaranty	3	0.6%	135	50.9%		Ambac Fin	28.3%	99.1%	MBIA	22.6%	100.0%
Farmowners Multiple Peril	3	0.5%	59	15.2%		Nationwide	8.5%	1.4%	State Farm	6.7%	0.4%
Federal Flood	3	0.5%	12	31.7%		Fidelity National	17.5%	72.8%	State Farm	14.2%	0.8%

Earthquake	2	0.5%	-2	30.3%	CA Earthquake	20.7%	100.0%	State Farm	9.6%	0.5%
Aircraft	2	0.5%	46	41.6%	AIG	28.9%	2.1%	Berkshire Hathaway	12.7%	1.9%
Other Accident and Health	2	0.4%	79	63.8%	State Farm	40.8%	1.6%	CNA	23.0%	5.0%
Credit	2	0.3%	95	32.8%	AIG	18.6%	1.0%	Old Republic	14.2%	7.3%
Fidelity	1	0.2%	36	36.6%	Chubb	20.6%	2.5%	Travelers	16.0%	0.9%
Boiler and Machinery	1	0.2%	31	42.8%	FM Global	25.5%	11.1%	AIG	17.3%	0.6%
Burglary and Theft	0.2	0.0%	16	40.4%	Travelers	20.9%	0.2%	Chubb	19.5%	0.3%
Miscellaneous	3	0.6%	101							
TOTAL	488	100.0%								

Source: Best's Review (August, 2008)

Half of the premiums written in the industry are spread over more than twenty markets, whereas two lines – personal auto and homeowners – concentrate almost half of the total premiums written. In these markets, two firms have a large share – State Farm and Allstate, being responsible for almost a third of the total premiums written in each market. These firms' stakes in these markets are also high – approximately two thirds of State Farm's premiums and half of Allstate's premiums are written in these markets. Interestingly, some firms pursue a nearly dominant business strategy in some markets (e.g. financial and mortgage guaranty, earthquake, and multiple peril crop), whereas others have a diversified business scope.

4.2.3 Insurance operations

4.2.3.1 Organizational forms

Any firm within the insurance industry has three important functions: the *manager* function – the decision makers who establish the corporate strategy; the *owner* function – those who provide capital and bear risks; and the *customer* function – the policyholders who pay the premiums. The organizational forms within the insurance industry – *stock, mutual and Lloyds* – differ in the manner in which they combine these three functions.

In *stock companies*, the distinguishing characteristic is the potentially complete separation of the manager, owner, and customer functions. These companies are the most prevalent type of proprietary insurer in the U.S. In *mutual companies*, the policyholders are both customers and owners. This type of insurer is formed to provide insurance at a minimum cost to policyholders, who own the insurer. Generally, it is assumed that the stock and mutual companies have different goals, as the former seeks to maximize profits, whereas the latter seeks to minimize administrative costs and insurance losses, because mutual firms are formed to provide insurance at a minimum cost to policyholders.

Lloyds are another kind of organizational form. They are not an insurance company, but a marketplace such as a stock exchange. In Lloyds, syndicates of members typically underwrite policies, and members delegate the day-to-day management to the syndicate manager. Thus, the manager and the owner functions are merged. Yet a very prominent organizational form overseas (e.g. the Lloyds of London provide complex coverage for marine insurance), American Lloyds account for a very small amount of U.S. premiums, most localized in the state of Texas.

4.2.3.2. Organizational actors

As in agency theory, an *agent* represents the insurer ("the *principal*") in the performance of some function. Legally, an agent can be either an employee of the principal or an independent contractor. The term *broker* is reserved for independent contractors who represent policyholders in dealing with insurers. In effect, a broker acts as an agent of the policyholder. Another actor in insurance marketing is a *producer*, defined as a person who sells insurance to customers. Producers can be employees of insurers, agents, or brokers.

4.2.3.3. Value chain

The insurance business is complex and a considerable amount of expertise is required to successfully operate an insurer. Insurers perform three core functions to meet their goals: marketing, underwriting, and claims. Other functions are: Loss control, Reinsurance, Actuarial, Investments, Information Technology, Human Resources, Accounting, and Legal Services.

Marketing and distribution systems. Marketing involves determining what products or services customers want and need and delivering them to those customers. Once the marketing plan has been developed, insurers market their products and services through distribution systems. Property-liability insurance can be distributed through an independent agency system, exclusive agency system, and direct writer system. The *independent agency and brokerage system* use producers who are independent contractors and are free to represent as many or as few insurers as they want. The *exclusive agency* also uses producers who are independent contractors, but they are restricted by contract to representing a single insurer. The *direct writer system* uses producers who are employees of the insurers they represent.

No one distribution channel meets the needs of all insurers and all insurance customers. The independent agency and brokerage system is likely to attract buyers who have complex insurance needs or consider quality of service more important than cost. For example, it is used to market lines of commercial insurance since these lines require more direct involvement from the producer. On the other hand, the exclusive agency and direct writer system are used more frequently for personal insurance. Since the insurance industry is very competitive, insurers find it advantageous to use multiple distribution channels, including internet.

Underwriting. The underwriting department's responsibility is to determine whether the applications received meet the guidelines established by the insurer. The department's goal is to write a profitable book of business for the insurer. Underwriters work with the marketing department to accept those accounts most likely to produce a profit for the insurer. However, underwriting liability presents many challenges for underwriters. Legislation and court decisions require frequent changes to policy forms and underwriting guidelines. Such an environment requires underwriters to keep up to date with emerging issues.

Claims. The first goal of the claim function is to satisfy the insurer's obligations to the policyholder as set forth in the insurance policy. Following a loss, the promise of the insuring agreement to pay, defend, or indemnify in the event of a covered loss is fulfilled (A. M. Best, 2007). The second goal is supporting the insurer's profit goal, which means that the claims function help insurers achieve an underwriting profit through controlling expenses. The claim function also provides valuable information to other departments such as marketing, underwriting, and actuarial.

4.2.4. Regulation

The insurance industry is regulated at the state and federal levels. State insurance departments implement specific directives from the legislature, extending from incorporation to liquidation and encompassing several activities in between. Two important functions of state insurance regulators are solvency and market regulation. Rejda (1998) notes that there are two primary reasons for regulators' concern with insurer solvency. First, due to the nature of the insuring agreement, premiums are paid prior to the payment of any loses that may arise. Hence,

regulation reduces the possibility that future losses will not be paid. Second, through solvency, the economic hardship policy holders would suffer as a result of failure of an insurer can be reduced. Regulators limit insolvency risk by requiring insurers to maintain a minimum amount of capital and surplus and meet other financial requirements.

It is important to distinguish between limiting insolvencies and preventing insolvency, as well as to understand their potential consequences. Limiting insolvency risk implies that some insurers may become insolvent as failure is likely to occur in any competitive market (Joskow 1973). On the other hand, preventing any insolvency from occurring would make the regulation very stringent, thus leading firms to constrain their investments to reduce the likelihood of failure. The result would be high insurance prices and inefficient markets, a situation that regulation attempts to prevent in the first place (Redja, 1998).

Market regulation is another function of state insurance regulators. The fundamental objective is to promote the proper functioning of insurance markets to serve the interest of consumers and society (Joskow 1973). For the personal property-liability lines, half of the U.S. states require rates to be filed and receive prior approval before they go into effect, whereas other states rely on competition to regulate prices (Klein, 1995).

A recurring issue in market regulation is whether insurance markets are competitive. Research on the effects of rate regulation has generally found that prior approval systems *do not* have a strong effect on premium levels or profitability (Klein, 1995). In other words, markets with prior approval systems and competitive rating tend to perform similarly on average.

Throughout its history, the insurance industry in the U.S. has seen several regulatory acts that either tighten or relax the norms. The latest act regulating financial services industry, including insurers, was the Gramm-Leach-Bliley Act of 1999 (GLB Act). Also know as the

Financial Services Modernization Act, the GLB Act revolutionized the way that providers of goods and services within the financial services industry do business. A bank, an insurer, and a securities firm are now allowed to affiliate under common ownership and offer customers a wide array of financial services products. This act resulted in the entry of banking institutions into the insurance industry as sellers and distributors of insurance products. On the other hand, more than eight years later, few insurance carriers have realized their goals in selling banking products through their vast agency networks (Best's Review September 2008).

The debate over state versus federal regulation has also been a persistent issue in the insurance industry. Those who support regulation at the state level argue that this state regulation is more responsive to local needs and that federal regulation would dilute states' rights. On the other hand, proponents of federal regulation argue that the centralization would make regulation more efficient and uniform. According to the 2009 state regulatory budgets to the National Association of Insurance Commissioners, regulatory spending varies significantly nationwide, ranging from a high of $30 per resident in Delaware to a low of $2 per resident in 11 other states. Overall, the 50 U.S. states and the District of Columbia are projected to spend more than $1.54 billion in 2009 on the regulation of insurance. Congress is now weighing proposals to create a federal regulatory option for insurance, particularly since insurance regulation has proven to be a profit center for most states. For example, states collected $2.58 billion in fees and penalties imposed on companies last year, providing a "regulatory surplus" of nearly $1.2 billion.

CHAPTER 5 – DATA AND METHODOLOGY

5.1 Data source and operationalization

The data for the property liability insurance industry comes from the National Association of Insurance Commissioners (NAIC) annual statements. They include information concerning both private and public firms operating in the property and liability insurance segment in the U.S., including statutory filing data on income statements, balance sheets, and other insurance-related aspects of the business. The data contain the breakdown of premiums written and losses incurred from 22 property-liability product lines in the U.S. 50 states and the District of Columbia. All insurance companies operating in the U.S. are required to file this statement annually. Thus, the database contains annual information on the entire population of firms in the U.S. property-liability insurance industry.

The annual statement for each firm is made up of 95 reports. These reports are recorded as large text files, and I subsequently, imported them into SAS data sets. Before running any statistical analysis, I needed to extract the information from these data sets and create a database that contains data on every dependent, independent, and control variables of the study. SAS software provides two programming languages for data set manipulation: *DATA step* and *Structured Query Language (SQL)*. DATA step is a group of SAS programming statements used for reading, combining, and modifying data sets. SQL is a standardized, widely used language that uses relational algebra for data retrieval and updating. In SQL, the data sets are considered collection of objects or *tables* and SQL provides a natural language to establish relationships among the tables.

Although more complex and requiring more training than SAS DATA step, SQL has more functionalities that provide flexibility in terms of programming and data management. For example, while SAS DATA step manipulates the data sets sequentially, with SQL it is possible to create indexes that provide quicker access to data. Indices can be created on any combination of attributes on a table. Queries that filter using those attributes can find matching records randomly using the index, without having to check each record in turn. Another advantage is that the relationships established between tables eliminate the duplication of data, which in turn prevents data manipulation anomalies and loss of data integrity.

In order to create the study's database, I developed a group of SQL programs that performed the following tasks: (1) data gathering from annual statements, (2) sample selection; (3) calculation of measures; (4) creation of observations; and (5) data consolidation for subsequent statistical analysis.

(1) Data gathering. There is a particular layout of the data for each report of the NAIC annual statement. The first task is then to identify the source file in the annual statement database that contains the data I need. Next, I develop SAS programs that read the annual statement database and that record the chosen variables in relational tables. The resulting tables are the input for the subsequent programs.

(2) Sample selection. Multimarket contact – one of the most important measures in the study – is a *relational* measure, as it takes into account the overlap of contacts that a focal firm has with incumbents outside the focal market. Hence, the group of firms to be considered competitors, i.e. the sample of firms must be defined *before* the measure is calculated. Consequently, whenever the sample criteria change, the measure needs to be recalculated. The criteria for sample

selection are described in section 5.2. The SQL program deletes the insurers that do not meet the criteria, creating the input for the next program.

(3) Calculation of measures. This SQL program calculates the measures of the study (e.g. multimarket contact, Herfindhal index, aspiration levels, density, market experience, etc). The calculation is described in section 5.2. The results are stored in SQL tables to be used in the next process.

(4) Creation of observations. The SAS program reads the SQL tables previously recorded and create individual observations *(rows)* containing values for the dependent, independent, and control variables.

(5) Data consolidation. The SAS program combines the individual tables recorded for each year into a single file for Stata sofware. Since there is an individual NAIC database for each year of observation, I must run steps 1 through 4 twenty times, one for each year of observation. Because processing time increases exponentially with the number of firms and years of observation, the process would take on average 20 hours to complete in a regular single processor computer. Thus, in order to optimize time and resources, I run the SAS programs in an IBM System p5, a supercomputer suitable for research computing.

5.2. Sample

This dissertation encompasses data for the 1998-2008 period. The potential sample of firms consists of all property-liability insurers writing two specific types of insurance: homeowners and private passenger automobile insurance. These lines were chosen because they are B2C (Business to Consumer) transactions, representing almost half of total book-of-business in property-liability insurance industry. Firms operating in these markets are likely to compete

head-to-head with little differentiation, whereas B2B (Business to Business) lines require specialized underwriting capabilities, which may mask the effects of multimarket contact. Since there are 51 geographic markets (50 states and D.C.) and 2 product markets (homeowners and private passenger automobile), the maximum number of geo-product markets in this study is 102 geo-product markets.

Insurance companies may be structured as a single insurer or as an affiliate of an insurance group. For example, a single insurer may operate in several states, or an insurance group may set up multiple affiliates to cover different geographic areas or types of business. Since this dissertation examines the scope of geo-product markets served by each insurance company regardless of how the company is structured – as a single insurer or as a set of affiliated companies – I consolidated single insurers that belong to the same group as one observation unit in my sample. In the case where multiple insurers are grouped as one unit, the values for dummy variables are based on the lead insurer in the group, and continuous variables (e.g. assets, premiums, etc) are constructed by aggregating values of all firms in the group.

Insurers with negative assets or negative values on any other important financial information (e.g. surplus or revenues) were deleted. Moreover, following cut-off criteria commonly used in property-liability insurance research (e.g. Choi Weiss 2005), I deleted firms with a low market share, because very small companies are less likely to have a significant impact on price and supply in the state market. The final sample consists of approximately 93 firms per year, representing 91% of revenues and 90% of assets of the firms writing homeowners and private auto insurance. The sample consisted of 94.795 firm-year-observations between 1999 and 2008[1]. The data take the form of one observation per firm per market segment per year.

[1] The observations for year 1998 are lost because of the lagging of all independent variables by one year.

Figures 5.1 through 5.2 shows trends in the industry over the decade covered by this analysis. Total revenues have increased over the years, whereas the number of firms competing in the industry has varied. On average, firms operate in 15 markets per year. The sample contains 25% of mutual firms and 75% of stock firms.

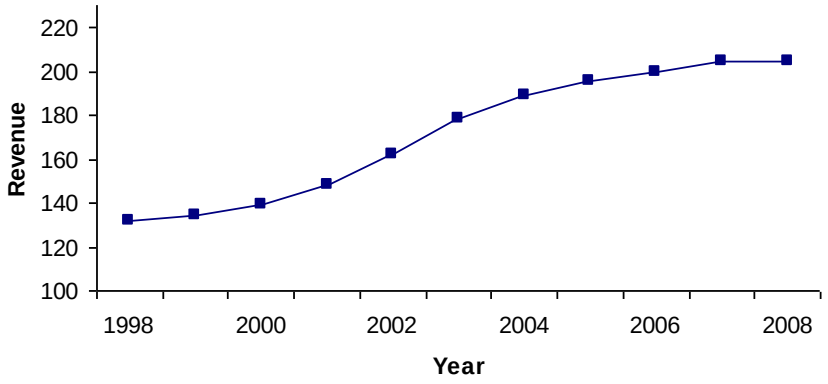


Figure 5.1 –Total revenue (premiums earned) per year

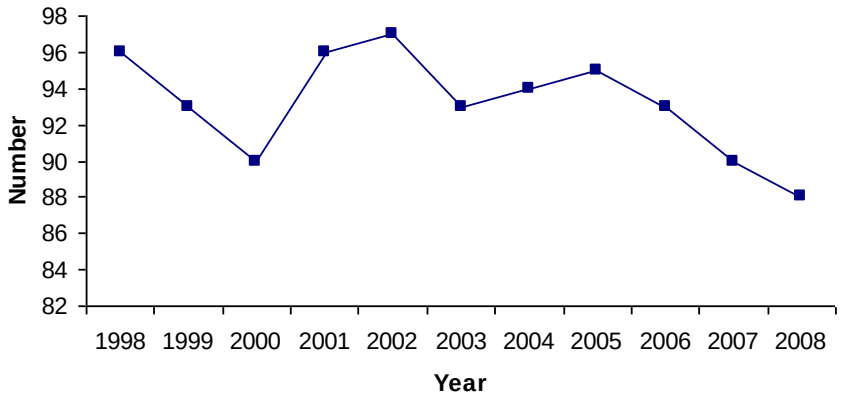


Figure 5.2 – Number of firms per year

5.3. Measurement

5.3.1. Dependent Variables

- *Market entry:* This variable is measured as a dichotomous variable. For each market a company can potentially enter in each year, a value of one is represented in the event of entry

into the geo-product market by that company in that year. A value of zero indicates that no entry was made by the company into the particular geo-product market during the year. I adopted the assumption that each company of the sample can potentially enter any of the markets in which it is not operating.

- *Market exit:* This variable is measured as a dichotomous variable. For each geo-product market a company is operating in each year, a value of one indicates exit from the focal market by that company in the following year. A value of zero indicates that the company continues to operate in that particular geo-product market in the following year. That means that I adopted the assumption that each company of the sample can potentially exit from any of the markets in which it is currently operating. I define market exit as a firm's withdrawal from a market, irrespective of exit mode (e.g. divestiture). To identify exit, I compare a firm's portfolio of markets in year *t* with a firm's portfolio of markets in year *t-1*.

5.3.2. Independent Variables

- *Multimarket contact:* As described in Chapter 2, when choosing a measure of multimarket contact, one must make decisions regarding level of analysis, scaling, and weighing. Multimarket contact can be measured at several levels: dyadic, firm-in-market, firm-, and market levels (Gimeno & Jeong 2001). I opt to use the *firm-market level* measure because it captures the extent to which a firm's scope of business, outside of a focal market, is similar to other firms competing in that market. Multimarket contact at the dyad level is not appropriate for this study because I cannot determine the specific competitor toward whom a specific market entry or exit decision is aimed (Gimeno and Jeong 2001). Regarding scaling, I opt to scale the measure since scaling allows me to distinguish between a firm with 4 markets shared with rivals out of a

possible total of 4 in which it currently competes, and one that shares 4 markets out of a total of 40. Thus, I calculate the average percentage of markets that a focal company shares with the firms already competing in the focal market. Finally, I opt to *weigh* the measure according to the importance of the overlapping markets to the focal market. For example, the focal company A can potentially enter the state of Georgia in which companies B and C are already operating. If company A also meets with company B in the state of New York, which represents 80% of company A's revenues, as well as meets with company C in the state of Arizona, which represents 20% of company A's revenues, then A's contact with B would be more important than A's contact with C. The weight is the percentage of the focal firm's premium written obtained in the market. The measure is defined as:

$$MMC_{imt} = \frac{\sum_{j \neq i} \sum_{m} (I_{imt} \times I_{jmt}) \times w_{imt}}{\sum_{m} I_{imt}}$$

where MMC_{imt} is the multimarket contact of firm *i* in market *m* at time *t*; I_{imt} is an indicator variable set equal to one if firm *i* is active in market *m* at time *t* and zero otherwise; I_{jmt} is an indicator variable set equal to one if firm *j* is active in market *m* at time *t* and zero otherwise; and w_{imt} is the weight of market *m* for the focal firm I at time *t* relative to all markets it operates.

- *Firm performance:* Previous studies with samples of insurance firms have used *loss ratio* as a measure of profitability (e.g. Greve, 2008a), which captures the firm's underwriting performance. I use a form of *operating ratio* to gauge an insurer's profitability, which combines both underwriting and investment results. It is important that investment results be considered

because insurance firms generate substantial amounts of investable funds, and the return on investments may offset unprofitable underwriting activities in a given year. Operating ratio is calculated as follows:

Operating Ratio = (Loss Ratio + Expense Ratio) – Investment Income Ratio

where

$$Loss\ Ratio = \frac{LossesIncurred + LossAdjustmentExpenses}{PremiumsEarned}$$

$$Expense\ Ratio = \frac{ExpensesIncurred}{PremiumsWritten}$$

$$Investment\ Income\ Ratio = \frac{NetInvestmentIncome}{PremiumsEarned}$$

Data from income statements and balance sheets are used to calculate these ratios. When a firm has an operating ratio of less than 100, this indicates that it is able to generate a profit from its operations and investments. I subtracted the operating ratio from 100 percent so that the measure can reflect the percentage profit margin.

- *Aspiration level:* I calculated the measure of aspiration level as a mixture of past-period aspiration level and the previous performance of the focal firm, defined as a weighted moving average (Levinthal & March, 1981). Historical aspiration level is calculated as $A_t = aA_{t-1} + (1-a)P_{t-1}$, where *A* is the aspiration level, *P* is the performance, *t* is year, and *a* is the weight given to the most recent aspiration level.

- *Performance relative to aspiration level:* Also known as attainment discrepancy (Lant 1992), this variable represents the gap between actual performance and expected goals. Performance relative to aspiration level is calculated by subtracting aspiration level from actual performance achieved. Thus, when performance exceeds aspiration level, performance relative to aspiration level is positive. When performance is below aspiration level, performance relative to aspiration

level is negative. Because the behavioral theory of the firm predicts different risk preferences for firms that perform above and below aspiration level, a common way of operationalizing this variable is to include elements of a spline function (Greve, 1998). A spline this function avoids inappropriate "jumps" in the estimated Y values due to changes in slope. Consistent with prior studies (e.g. Audia & Greve, 2006; Greve, 1998), I estimated two spline dummy variables, one for performance above aspiration level and another for performance below aspiration level. The former takes the value of the performance minus aspiration level if performance is greater than or equal aspiration level and zero otherwise. The latter takes the value of the performance minus aspiration level if performance is less than aspiration level and zero otherwise. Consequently, the model can estimate distinct coefficients on the performance above and performance below aspiration level.

- *Organizational slack:* Consistent with results from recent studies (e.g. Iyer and Miller, 2008; Shimizu 2007), I use liquidity ratio, calculated as total assets divided by current liabilities. Consistent with Audia and Greve (2006), I normalized slack between 0 and 1: The firm with lowest slack has a score of 0 and the firm with highest slack has a score of 1. All other firms have a score in between. The normalization is important because the shifting-focus model of risk taking contends that slack affects decision makers' choice of the referent point and that this choice affects risk preference: Large slack lowers the survival point, whereas small slack raises it. Normalizing slack allows us to observe distinct effects for low and high slack. An alternative operationalization such as a centered slack does not capture this distinction.

5.3.3. Control Variables

In order to avoid spurious correlations, I control for several alternatives explanations for market entry and exit at the firm- and market level.

Firm characteristics. I control for *firm size,* measured as the logarithm of total admitted assets. I also control for type of firm – mutual or stock. Managers in mutual and stock firms may have different goals – managers in stock firms seek to maximize profits, whereas managers in mutual firms seek to minimize losses. The indicator variable is 0 for stock and 1 for mutual firms. To account for organizational learning explanations (Amburgey & Miner 1993), I include two variables: *market experience* and *entry experience*. The former is operationalized as the number of markets in which the firm operates at $t - 1$, and the latter, as the number of entries of firm i at $t - 1$.

Market characteristics. To account for population ecology explanations (Hannan & Freeman 1982), I include *density* and *density squared* in the model, measured as the number of firms operating in the target market at t - 1. I also control for mimetic explanations of market entry (Haveman 1993), defined as *market attractiveness.* This variable is measured as the number of entries into the target market at $t - 1$. To control for oligopoly theory explanations (Scherer & Ross, I used *market concentration*, operationalized as the Herfindahl index (Baum & Korn, 1996; Fuentelsaz & Gomez, 2006; Stephan et al., 2003). Market and regional differences are controlled for in the model specification.

5.4. Data Analysis

This dissertation examines market entry and exit patterns occurring over time. The main goal is to understand how interactions between the competition-related and firm-specific factors affect a firm's likelihood of entering into or exiting from markets. Thus, my hypotheses deal with

causal relationships as well as involve binary dependent variables. Both logistic regression and event history modeling are estimation techniques used for this kind of empirical analysis. However, since the characteristics of the process under study 'guide' design decisions (Coleman 1981), it is important to understand the characteristics associated with multimarket studies and choose the method that effectively deals with such issues.

First, this study uses a panel data sample that provides multiple observations on each firm in the sample, incorporating cross-sectional and time-varying variables. In such an empirical setting researchers are urged to control for unobserved heterogeneity, which occurs when some unobserved variables correlate with the observed independent and dependent variables. Hence, the method must provide techniques for dealing with unobserved heterogeneity. Second, a critical assumption in multimarket studies is that firms attempt to coordinate their actions across markets. Thus, the common assumption of independence of observations is violated, since some of a firm's moves may be part of a coordinated strategy. Hence, the statistical method must deal with this issue effectively. Both logistic regression and event history methods are briefly described and compared in turn.

5.4.1 Logistic regression modeling

Logistic regression belongs to the group of regression methods for describing the relationship between explanatory variables and a discrete response variable. The difference between ordinary least square (OLS) regression and logistic regression modeling lies in the fact that for linear regression the response variable Y is continuous, which is one of the classical assumptions for ordinary least squares to yield BLUE estimators. When this assumption is unmet, OLS poses

serious inference problems. Consequently, when the response variable is discrete, maximum likelihood techniques such as logistic regression are generally more efficient.

To obtain the logistic model, one must start from the linear probability model, which is a linear sum determined by constant, unknown parameters β_i, independent variables denoted as x_i and an error term:

$$\text{P(of_occurring_the_event)} = \alpha + \beta X + \varepsilon \qquad \text{(Equation 5.1)}$$

Since the linear model suffers from estimates lying outside the [0, 1] range, the linear model must be transformed to a non-linear logistic model (equations 2 and 3):

$$\text{Ln}\,(\text{Odds_of_occuring_the_event}) = \text{Ln}\,\frac{\text{P(of_occuring_the_event)}}{\text{P(not_occuring_the_event)}} = \alpha + \beta X + \varepsilon \qquad \text{(Equation 5.2)}$$

$$P(\text{of_occuring_the_event}) = \frac{\mathrm{e}^{\alpha+\beta \mathrm{X}+\varepsilon}}{1+\mathrm{e}^{\alpha+\beta \mathrm{X}+\varepsilon}} \qquad \text{(Equation 5.3)}$$

A logit model ensures that the probabilities will be within the [0, 1] range. The model also assumes that errors follow a binomial distribution, which approximates a normal distribution for large samples (Coleman, 1981).

There are two different ways to estimate the coefficients and control for unobserved heterogeneity: the fixed effects approach and the random effects approach. Controlling for fixed effects involves the estimation of intercept terms, which are operationalized as dummy variables. This technique accounts for effects that are likely to differ between markets, firms, or firm-in-markets, but remain constant for multiple observations (Greene 2003). The random effects

estimation assumes that the individual-specific intercepts are random-drawings from an unknown distribution. Hausman's (1978) test can help determine the most appropriate approach to model the intercepts.

Regarding the lack of independence of observations, previous multimarket studies propose some techniques to minimize the biasing effects. Barnett (1993) considers multimarket firms oversampled within the dataset and proposes a technique in which observations in the dataset are inversely weighted based on their degree of overrepresentation as a function of the multimarket ties of a particular firm. This technique minimizes the biasing effect due to oversampling and has been used by many multimarket studies (e.g. Baum and Korn 1996; Boeker et al. 1997; Stephan et al. 2003).

I now describe the event history methodology, highlighting its features that set it apart from logit and other traditional regression models.

5.4.2 Event history modeling

Event history modeling is a method for causal analysis of processes characterized in the following way: (1) there is a collection of units (e.g. individuals, firms, societies, etc), each moving among a finite number of states in a state space; (2) these changes (or events) may occur at any point in time; and (3) there are time-constant and/or time-dependent factors influencing the events (Coleman 1981, p. 6).

In other words, causal statements in event history modeling are examined by looking at *conditions that change over time*. These changes are events – an event is a change in a variable – and that happens at a specific point in time. The role of the event is to indicate that a causal factor has changed at a specific time and that the unit under study is exposed to another causal

condition (Blossfeld, Golsch, and Rohwer 2007). Causal statements can be summarized in the following way:

$$\Delta X_t \rightarrow \Delta \Pr(\Delta Y_{t'}) \qquad t' > t \qquad \text{(Equation 5.4)}$$

This means that a change in X_t will change the probability that the dependent variable $Y_{t'}$ will change in the future ($t' > t$). Although logistic regression models also estimate probabilities, event history models offer an additional feature: a *time-related* representation for the causal effect. This idea can be explained with equations. First, suppose that T is a random variable that represents the duration until a change in the dependent variable occurs. Then, the transition probability can be defined as:

$$\Pr(t \leq T \leq t' | T \geq t) \qquad t < t' \qquad \text{(Equation 5.5)}$$

This is the probability that an event occurs in the time interval from t to t'. The probability of future changes in the dependent variable per unit of time is defined as the ratio of the transition probability to the length of the time interval:

$$\frac{\Pr(t \leq T \leq t' | T \geq t)}{t' - t} \qquad \text{(Equation 5.6)}$$

Finally, the *transition rate* is defined as

$$r(t) = \lim_{t' \to t} \frac{\Pr(t \leq T \leq t' | T \geq t)}{t' - t} \qquad \text{(Equation 5.7)}$$

where *r(t)* is the instantaneous rate of occurring the event. It can be interpreted as the propensity to change the state, from origin state *j* to a destination state *k*, **at time *t***. Again, this means that

r(t) is a transition *rate*, not a transition probability, particularly because it can be greater than 1. For instance, if *r(t)* is constant over time, say *r(t)* = 1.25, then 1.25 is the expected number of events in a time interval that is one unit long. Alternatively, 1/*r(t)* gives the expected length of time until an event occurs, in this case .80 time units. This way of defining the hazard rate also closely corresponds to intuitive notions of risk. For example, if two persons have hazard rates of .5 and 1.5, it is appropriate to say that the second person's risk of an event is three times greater (Allison, 1982).

The transition rate is often referred to as a *hazard rate*. The term *hazard* comes from biostatistics, where the typical event is death (Allison 1984). The term *transition rate* is more often used in sociology, where many analyses have been made of transitions between discrete states, such as marital and employment statuses (Yamaguchi 1991). In strategy, the term hazard rate is more commonly employed than transition rate. Hence, I use the term *hazard rate* in this dissertation.

The hazard rate provides the possibility of giving a *time–related* description of how the process under study evolves over time. Yet it is important to realize that although the models are called *time-dependent*, time itself is not a causal factor. Time dependence can be interpreted as a proxy for time-varying causal factors that are difficult to observe (Tuma and Hannan 1984). For instance, using event history methodology, Gimeno et al. (2005) were able to accommodate unobservable factors beyond mimetic processes that may influence the rate of a firm's entry into a host country. Time dependence might also be seen as a result of a diffusion process, in which some sort of contagion, imitation, or simply social pressure drives the process under study (Greve, Strang, and Tuma 1995).

Figure 5.1 illustrates different examples of how the effect of *x* on *y* develops in time. In Figure 5.1(a), the effect of *x* on *y* is time-dependent as it increases over time. Consequently, the hazard rate is affected by both change in the covariates and the passing of time. A somewhat similar effect is also shown in Figure 5.1(b), in which a cyclical effect pattern is described over time. In Figure 5.1(c), the effect of *x* on *y* is time-constant, that is to say the effect of x on y does not change with the passing of time. In this case, the transition rate is a function of the explanatory variables only, a situation akin to traditional regression models.

Statistically, there are many possibilities for specifying the functional form of the hazard rate. On one hand, *parametric event history models* assume that the shape of time dependence for the hazard rate can be modeled as a known distribution, such as exponential, Weibull, Gompertz, lognormal, or gamma, to name a few. For instance, in a parametric model with Gompertz distribution – a model successfully applied in studying the lifetime of organizations (Freeman, Carroll, and Hannan 1983) – the hazard rate is assumed to decrease monotonically with time. The choice of one distribution over another is usually grounded on theory or previous empirical research (Allison 1984), but researchers can also use methods for assessing which model provides a better fit to the data, as described in Blossfeld et al. (2007).

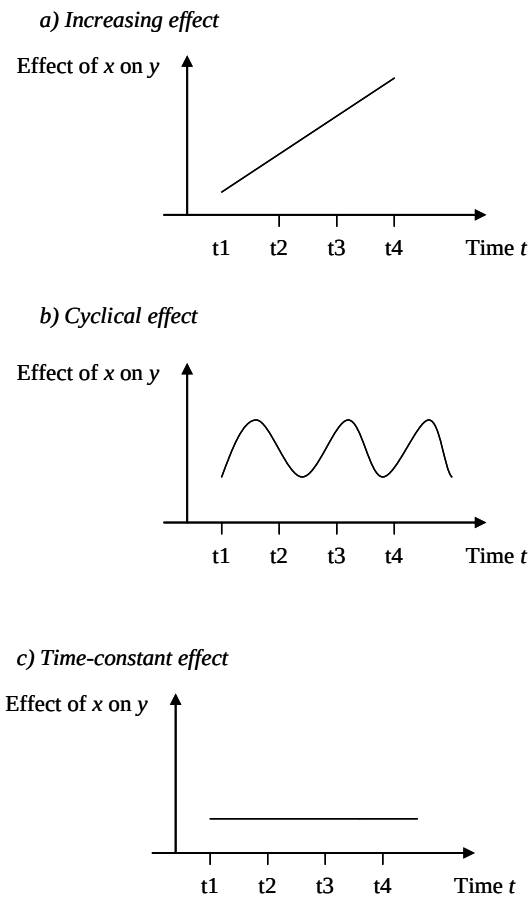


Figure 5.1 – Temporal shapes of how a change in *x* effects a change in *y*

On the other hand, *semi-parametric event history models* represent a more flexible way to handle time dependence, since these models assume time dependence without specifying its form (Yamaguchi 1991). The most widely applied semi-parametric model is the *proportional hazards model*, which is based on an estimation approach proposed by Cox (1972). The proportional hazards model assumes that hazard rates are a log linear function of parameters for the effects of covariates (Yamaguchi 1991). For example, the hazard rate of entry by firm *i* in market *m* at time *t* may be written as

$$h_{im}(t) = h_0(t) \times \exp(\beta X_{im}(t)) \qquad \text{(Equation 5.8)}$$

where the hazard rate, is the product of an unspecified baseline rate, $h_0(t)$, and a vector of independent and control variables, *X*.

Researchers can also estimate *stratified event-history models* (Blossfeld et al., 2007). In a stratified model the baseline rate $h_0(t)$ can be different for each category of a specific explanatory variable. In other words, the baseline hazards are allowed to differ by group, although the coefficients are constrained to be the same. For example, in a sample of multinational firms, competitive conditions may vary depending on the host country in which firms operate. Hence, rather than assuming that all firms face the same baseline hazard, a stratified model for this sample would include unique country-specific baseline hazard rates to account for host country differences.

5.5 Model Specification and Estimation

Consistent with prior studies in multimarket competition and behavioral theory (e.g. Barnett 1993; Haveman and Nonnemaker, 2000; Iyer and Miller, 2008), I opted to use event history modeling. The distributions for time to an event like market entry or exit might be dissimilar from normal, as they are almost certaintly nonsymmetic. Thus, the problem of logistic linear regression to analyze survival data is with the assumed normality of the residuals. Moreover, in analyzing entry, censoring may occur when a firm no longer operates in a given market or when entry has not occurred until the end of the study. Event history models effectively deal with nonnormality and censoring issues.

This methodology also permits that the observations for the same entity to be divided into groups of independent observations to account for the correlation between observations belonging to the same firm. This aspect is important in this dissertation, as a focal firm can enter

several markets in a given year and such decisions are not independent. Furthermore, event-history stratified models permit the estimation of a distinct baseline rate for each market, so that any idiosyncrasies of the market (e.g. stringent state market in terms of state regulations) can be controlled for.

In this dissertation I estimate a stratified proportional hazards model. As above mentioned, proportional hazards models represent a flexible way to handle time dependence, provided that the sample satisfies the proportionality assumption. I test this assumption and present the results in Chapter 6.

My theoretical model presents empirical challenges as it integrates behavioral antecedents into multimarket competition. To translate this theoretical integration into a testable model, I combine empirical methods from prior research in both multimarket competition and the behavioral theory of the firm.

The specification of my empirical model follows the theory. First, I create a baseline model with firm- and market-level control variables. Next, because my hypotheses build on the arguments from the behavioral theory of the firm and the shifting-focus model of risk taking, I test whether the behavioral predictions are supported. I start including the dummy variables for performance $PerfBelowAsp_{t-1}$ and $PerfAboveAsp_{t-1}$, which represent the behavioral variables from the behavioral theory of the firm (Cyert & March, 1963). Consistent with Audia and Greve (2006), I then include the normalized measure of slack and its interaction terms with performance above and below aspiration level: $Slack_{t-1}$, $PerfBelowAsp_{t-1} \times Slack_{t-1}$, and $PerfAboveAsp_{t-1} \times Slack_{t-1}$. By including all these variables in the model, I am able to estimate effects of four conditions: (1) performance below aspiration level and low slack, (2) performance above aspiration level and low slack, (3) performance below aspiration level and

high slack, and (4) performance above aspiration level and high slack. Because the effect for the lowest-slack firm in the data is the main effect of firm performance, and the effect for the highest-slack firm in the data is the sum of the main effect of firm performance and slack, I interpret the effect of each condition as follows:

- Condition 1: coefficient on $PerfBelowAsp_{t-1}$
- Condition 2: coefficient on $PerfAboveAsp_{t-1}$
- Condition 3: sum of coefficients ($PerfBelowAsp_{t-1}$ + $PerfBelowAsp_{t-1} \times Slack_{t-1}$)
- Condition 4: sum of coefficients ($PerfAboveAsp_{t-1}$ + $PerfAboveAsp_{t-1} \times Slack_{t-1}$)

In testing March and Shapira's model, risk aversion for performance below aspiration level and low slack indicates a positive coefficient on $PerfBelowAsp_{t-1}$ and risk seeking for performance below aspiration level and high slack indicates a negative sum of the coefficients ($PerfBelowAsp_{t-1}$ + $PerfBelowAsp_{t-1} \times Slack_{t-1}$). Risk aversion for firms performing above aspiration level regardless of their level of slack indicates positive coefficients on both $PerfAboveAsp_{t-1}$ and $PerfAboveAsp_{t-1} \times Slack_{t-1}$.

Next, I include the linear and quadratic terms for multimarket contact MMC_{t-1} MMC_{t-1}^2 in the equation, representing the competitive antecedents of market entry.

Thus far, I have included sets of variables for behavioral and competitive antecedents. To integrate the behavioral logic into the mutual forbearance logic, I created the following two- and three-way interactions[2]: $MMC_{t-1} \times PerfBelowAsp_{t-1}$, $MMC_{t-1} \times PerfAboveAsp_{t-1}$, $MMC_{t-1} \times Slack_{t-1}$, $MMC_{t-1} \times PerfBelowAsp_{t-1} \times Slack_{t-1}$, $MMC_{t-1} \times PerfAboveAsp_{t-1} \times Slack_{t-1}$.

[2] To remove nonessential multicolinearity, I centered the predictors before running the analysis.

The effects of the four behavioral conditions on the mutual forbearance logic are captured as follows:

- Condition 1: coefficient on $MMC_{t-1} \times PerfBelowAsp_{t-1}$
- Condition 2: coefficient on $MMC_{t-1} \times PerfAboveAsp_{t-1}$
- Condition 3: sum of coefficients

$$(MMC_{t-1} \times PerfBelowAsp_{t-1} + MMC_{t-1} \times PerfBelowAsp_{t-1} \times Slack_{t-1})$$

- Condition 4: sum of coefficients

$$(MMC_{t-1} \times PerfAboveAsp_{t-1} + MMC_{t-1} \times PerfAboveAsp_{t-1} \times Slack_{t-1})$$

All the interactions with MMC_{t-1} account for changes in both the threshold at which the forbearance effect starts to operate (the inflection point) and the magnitude of the inverted-U curve (the amplifying and attenuating effects).

As mentioned in Section 5.3, my measures of market entry and exit are discrete (0 or 1) and my explanatory variables are a mix of continuous and discrete variables. Accordingly, I estimate a *discrete-time* stratified proportional hazards model[3]. The full equation for market entry is defined as follows:

$$\begin{aligned} h_{im}(t) = h_{0m}(t)\exp[&\beta_1 PerfAboveAsp_{t-1} + \beta_2 PerfBelowAsp_{t-1} + \\ &\beta_3(PerfAboveAsp_{t-1} \times Slack_{t-1}) + \beta_4(PerfBelowAsp_{t-1} \times Slack_{t-1}) + \beta_5 Slack_{t-1} + \\ &\beta_6 MMC_{t-1} + \beta_7 MMC_{t-1}^2 + \\ &\beta_8(MMC_{t-1} \times PerfAboveAsp_{t-1}) + \beta_9(MMC_{t-1} \times PerfBelowAsp_{t-1}) + \beta_{10}(MMC_{t-1} \times Slack_{t-1}) + \\ &\beta_{11}(MMC_{t-1} \times PerfAboveAsp_{t-1} \times Slack_{t-1}) + \beta_{12}(MMC_{t-1} \times PerfBelowAsp_{t-1} \times Slack_{t-1}) + \gamma' C_{t-1}] \end{aligned} \qquad \text{(Equation 5.9)}$$

where $h_{im}(t)$ is the instantaneous hazard rate of firm *i*'s entry into market *m* in *t*, $h_{0m}(t)$ is the baseline hazard rate for market *m*, and C_{t-1} is the vector of control variables.

[3] All of the empirical tests are run on the statistical computing package Stata

The implications of my hypotheses for the entry model coefficients are straightforward. The inverted-U curvilinear relationship between multimarket contact and market entry rates as predicted in the null hypothesis *0a* indicates a positive coefficient on MMC_{t-1} and a negative coefficient on MMC_{t-1}^2. The moderating effect as predicted in Hypothesis 1a indicates a positive sum of the coefficients on $MMC_{t-1} \times PerfBelowAsp_{t-1} \times Slack_{t-1}$ and $MMC_{t-1} \times PerfBelowAsp_{t-1}$, meaning that the effect of MMC_{t-1} on market entry rates is amplified under conditions of performance below aspiration level and high slack. Furthermore, the moderating effect as predicted in Hypothesis 2a indicates a negative coefficient on $MMC_{t-1} \times PerfBelowAsp_{t-1}$, meaning that the effect of MMC_{t-1} on market entry rates is attenuated under conditions of performance below aspiration level and low slack. Finally, the lack of a moderating effect for performance above aspiration level as predicted in Hypothesis 3a indicates non-significant coefficients on both $MMC_{t-1} \times PerfAboveAsp_{t-1}$ and $MMC_{t-1} \times PerfAboveAsp_{t-1} \times Slack_{t-1}$.

The full equation for market exit is defined as follows:

$$\begin{aligned} h_{im}(t) = h_{0m}(t)\exp[&\beta_1 PerfAboveAsp_{t-1} + \beta_2 PerfBelowAsp_{t-1} + \\ &\beta_3(PerfAboveAsp_{t-1} \times Slack_{t-1}) + \beta_4(PerfBelowAsp_{t-1} \times Slack_{t-1}) + \beta_5 Slack_{t-1} + \\ &\beta_6 MMC_{t-1} + \\ &\beta_7(MMC_{t-1} \times PerfAboveAsp_{t-1}) + \beta_8(MMC_{t-1} \times PerfBelowAsp_{t-1}) + \beta_9(MMC_{t-1} \times Slack_{t-1}) + \\ &\beta_{10}(MMC_{t-1} \times PerfAboveAsp_{t-1} \times Slack_{t-1}) + \beta_{11}(MMC_{t-1} \times PerfBelowAsp_{t-1} \times Slack_{t-1}) + \gamma' C_{t-1}] \end{aligned} \qquad \text{(Equation 5.10)}$$

where $h_{im}(t)$ is the instantaneous hazard rate of firm *i*'s exit from market *m* in *t*, $h_{0m}(t)$ the baseline hazard rate for market *m*, and C_{t-1} is the vector of control variables.

The implications of my hypotheses for the exit model coefficients are also straightforward. The negative relationship between multimarket contact and market exit rates predicted in the null hypothesis *0b* indicates a negative coefficient for MMC_{t-1}.

The moderating effect as predicted in Hypothesis 1b indicates a positive sum of the coefficients on $MMC_{t-1} \times PerfBelowAsp_{t-1} \times Slack_{t-1}$ and $MMC_{t-1} \times PerfBelowAsp_{t-1}$, meaning that the effect of MMC_{t-1} on market exit rates is attenuated under conditions of performance below aspiration level and high slack. Furthermore, the moderating effect as predicted in Hypothesis 2b indicate a negative estimated coefficient on $MMC_{t-1} \times PerfBelowAsp_{t-1}$, meaning that the effect of MMC_{t-1} on market exit rates is amplified under conditions of performance below aspiration level and low slack. Finally, the lack of moderating effects for performance above aspiration level as predicted in Hypothesis 3b indicates non-significant coefficients on $MMC_{t-1} \times PerfAboveAsp_{t-1}$ and $MMC_{t-1} \times PerfAboveAsp_{t-1} \times Slack_{t-1}$.

CHAPTER 6 – RESULTS AND DISCUSSION

This chapter tests the hypotheses of the proposed research model of this dissertation and includes the following sections: (1) results and (2) discussion of findings.

6.1 Results

Given that this study examines two distinct scope decisions, the results section is organized into two sub-sections, market entry and exit.

6.1.1 Market Entry

Means, standard deviations, ranges, and correlations are presented in Table 6.1. A look at the correlation matrix shows us no significantly high correlations between variables that could bias the estimates. Most importantly, the magnitude of correlations between the explanatory variables – MMC, slack, and performance above and below aspiration level – was low, indicating that multicollinearity was not a concern.

Some correlations between control variables are noteworthy. Firms with experience in several markets seem to have greater entry experience (r = .22). Large firms tend to have experience in several markets (r = .53), but seem to avoid crowded markets (r = .14). Moreover, crowded markets seem to be attractive (r = .21) and not concentrated (r = -.44).

Table 6.1 about here

As mentioned in section 5.5, I use a discrete-time stratified proportional hazards model in my analysis. Because this model assumes proportionality, I must test whether this assumption is

satisfied. I run two tests, one based on reestimation (linktest function in Stata) and the other based on Schoenfeld (1982) residuals (estat phtest function in Stata). The former tests whether the model is correctly specified and the latter tests whether the log hazard-ratio is constant over time. There was no evidence that the proportional hazards assumption was violated.

Tables 6.2, 6.3 and 6.4 present the event-history analysis estimates of market entry at time *t* as a function on the firm's behavioral and competitive antecedents at time *t – 1*. Each table shows the coefficient estimates, standard errors, and tests for significance of each variable. For each model, the log likelihood statistic is given along with other statistics that indicate model fit. I also assess the multiplier effect of each statistically significant variable. The multipliers are calculated as $\exp(\beta_x)$ and describe the risk of experiencing market entry relative to the baseline hazard.

Model 1 shows the baseline model, which contains the variables controlling for alternative market entry explanations. Firms are more likely to enter concentrated and crowded markets. A 1-unit increase in market concentration increased the rate of entry by 91 percent and an additional firm operating in the target market increased the rate of entry by 23 percent Moreover, firms with experience in several markets and firms that have engaged in market entry activity in the previous year are more likely to expand into new markets in the next year. Indeed, as the number of markets in which the firm operated or the number of entries in the previous year increases by 1, the rate of entry increased by 3 percent. Mutual firms are less likely to enter new markets. In fact, being a mutual firm reduced entry rates by over half (100% - 48%) from what the rates for stock firms are. Firm size and market attractiveness had no significant effect on market entry rates.

Table 6.2 – Behavioral Antecedents of Market Entry

Variables	Model 1			Model 2			Model 3		
Market concentration	0.65	***	(0.08)	0.65	***	(0.08)	0.64	***	(0.08)
Market density	0.21	***	(0.02)	0.21	***	(0.02)	0.20	***	(0.02)
Market density squared	0.00	***	(0.00)	0.00	***	(0.00)	0.00	***	(0.00)
Market attractiveness	0.01		(0.04)	0.02		(0.04)	0.02		(0.05)
Firm size	-0.12		(0.11)	-0.12		(0.11)	-0.12		(0.11)
Mutual	-0.72	**	(0.27)	-0.67	*	(0.27)	-0.58	*	(0.26)
Firm's market experience	0.03	***	(0.01)	0.03	***	(0.01)	0.03	***	(0.01)
Firm's entry experience	0.03	***	(0.01)	0.03	***	(0.01)	0.03	***	(0.01)
Performance above asp. Level				0.10		(0.53)	-6.74	**	(2.21)
Performance below asp. Level				-1.15		(0.74)	3.90	*	(1.73)
Slack							-1.47		(1.11)
Performance above asp. level * Slack							15.28	**	(4.46)
Performance below asp. level * Slack							-13.79	***	(3.25)
Observations	55,963			55,963			55,963		
Likelihood ratio chi-square (df)	342.74 (8)			451.44 (10)			483.76 (13)		
Probability > chi-square	0.00			0.00			0.00		
Log-likelihood	-7,392.43			-7,364.63			-7,256.31		
Log-likelihood ratio chi-square				55.60	***		272.25	***	

Robust estimates of standard errors are in parentheses.
† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$
Log-likelihood ratio chi-square is relative to Model 1

As mentioned in section 5.5, before testing the hypotheses of the study, I must test whether the shifting-focus model's predictions are supported. Model 2 adds the behavioral theory of the firm antecedents to the baseline model and shows that performance above and below aspiration level has a nonsignificant effect on market entry rates. Model 3 adds the interactions with slack. Because slack is normalized, the main effect now equals the effect on low slack firms and the main effect plus the interaction equals the effect on high slack firms. The significant estimates in Model 3 show that the nonsignificant effects in Model 2 were due to a blending of two opposite effects for firms with different levels of slack. Thus, the interactions with slack disentangled the effects of performance on low and high slack firms, which is consistent with Audia and Greve's (2006) findings. The main effect of performance below aspiration level has a positive effect on market entry rates, which indicates risk aversion in low-slack firms. The sum of the main effect

and the interaction of performance below aspiration level and slack has a significant negative effect on market entry rates (3.90-13.79=-9.89, $p < 0$), which indicates risk seeking in high-slack firms. In this and all subsequent models that include interactions of slack and performance below aspiration level, the sum of the coefficients is negative, consistent with risk seeking in high slack firms. To clarify this interaction, I plotted the multiplier effect of performance below aspiration level on market entry rates over the observed range of performance below aspiration level at low and high levels of slack.

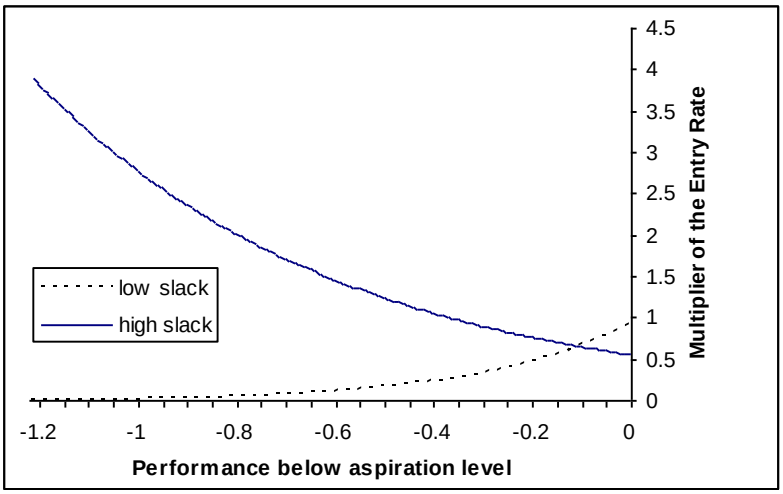


Figure 6.1 – Interactive effects of slack and performance below aspiration level on market entry rates

The graph shows that when performance below aspiration level decreased by one standard deviation, market entry rates decreased by 41 percent for low-slack firms and increased by 31 percent for high-slack firms. Thus, low-slack firms are risk averse and high-slack firms are risk seekers with distance below aspiration level, which is consistent with March and Shapira's model.

Regarding performance above aspiration level, the main effect has a negative and significant effect on market entry rates, which indicates risk aversion in low-slack firms. The sum of the

main effect and the interaction of performance above aspiration level and slack has a positive effect on market entry rates (-6.74+15.28 = 8.54, $p < 0$), which indicates risk seeking in high-slack firms. In this and all subsequent models with interactions of slack and performance above aspiration level, the sum of the coefficients is positive, consistent with risk seeking in high slack firms. To clarify this interaction, I plotted the multiplier effect of performance above aspiration level on market entry rates over the observed range of performance above aspiration level at low and high levels of slack.

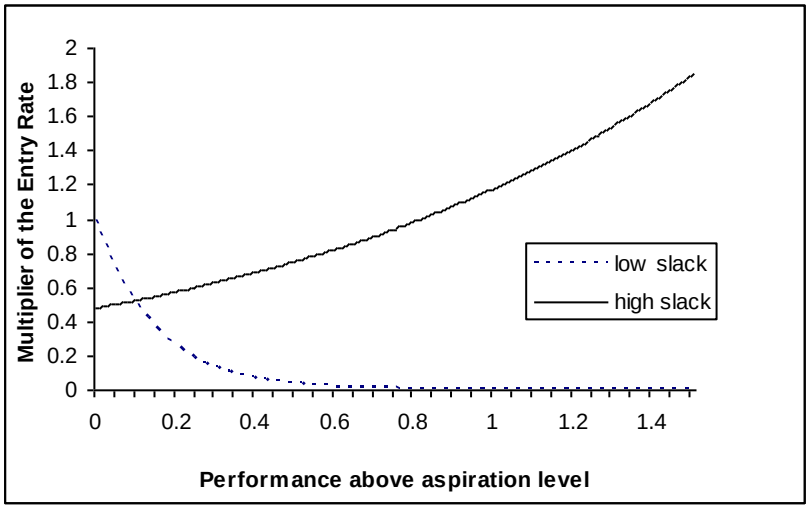


Figure 6.2 – Interactive effects of slack and performance above aspiration level on market entry rates

The graph shows that when performance above aspiration level increased by one standard deviation, market entry rates decreased by 82 percent for low-slack firms and increased by 25 percent for high-slack firms. Thus, low-slack firms are risk averse and high-slack firms are risk seekers with distance above aspiration level. These results are *not* consistent with Audia and Greve (2006), as they found that large firms, irrespective of performance, are risk averse. However, these results are consistent with Baum et al. (2005) findings that performance far

above aspiration levels has a similar effect on risk taking as performance far below them. Furthermore, these findings resonates March and Shapira's (1992) contention that low slack firms do reduce risk.

Table 6.3 presents main effects of behavioral and competitive antecedents on market entry rates. Before testing the moderating hypotheses of the study, I must test whether the mutual forbearance hypothesis (H0a) is supported. Model 4 adds the linear and quadratic terms of multimarket contact to the baseline model and shows an inverted-U-shaped effect of multimarket contact. Thus, H0a is supported.

Table 6.3 – Behavioral and Competitive Antecedents of Market Entry (Main Effects)

Variables	Model 4		Model 5		Model 6	
Market concentration	0.63***	(0.08)	0.63***	(0.08)	0.62***	(0.08)
Market density	0.21***	(0.02)	0.20***	(0.02)	0.20***	(0.02)
Market density squared	0.00***	(0.00)	0.00***	(0.00)	0.00***	(0.00)
Market attractiveness	0.01	(0.04)	0.01	(0.04)	0.02	(0.04)
Firm size	-0.11	(0.12)	-0.11	(0.12)	-0.11	(0.12)
Mutual	-0.82**	(0.24)	-0.77**	(0.23)	-0.69**	(0.23)
Firm's market experience	0.03***	(0.01)	0.03***	(0.01)	0.03***	(0.01)
Firm's entry experience	0.03***	(0.01)	0.03***	(0.01)	0.03***	(0.01)
Performance above asp. Level			-0.01	(0.54)	-7.03**	(2.29)
Performance below asp. Level			-1.01	(0.73)	3.76*	(1.72)
Slack					-1.31	(1.15)
Performance above asp. level * Slack					15.72**	(4.57)
Performance below asp. level * Slack					-13.03***	(3.24)
MMC	5.63***	(1.38)	5.64***	(1.36)	5.74***	(1.43)
MMC squared	-11.16*	(5.20)	-10.27*	(5.80)	-9.72*	(4.90)
Observations	55,963		55,963		55,963	
Likelihood ratio chi-square (df)	351.18 (10)		413.38 (12)		450.58 (15)	
Probability > chi-square	0.00		0.00		0.00	
Log-likelihood	-7,225.96		-7,203.83		-7,097.65	
Log-likelihood ratio chi-square	332.95***		377.20***		589.57***	

Robust estimates of standard errors are in parentheses.
† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$
Log-likelihood ratio chi-square is relative to Model 1

Figure 6.3 presents the effect graphically. The inflection point of this curve occurs at a value of .24 for multimarket contact[4], and lies within the observed range for multimarket contact (0 to 1). Thus, as multimarket contact increases from 0 to .24, the rate of market entry also increases, reaching a multiplier effect of 1.98, which indicates that the level of multimarket contact at the threshold nearly doubled market entry rates. Above the threshold, the rate of entry starts to decrease, reaching a multiplier close to zero, which indicates that the rate of entry at the highest level of multimarket contact is decreased by almost 100%.

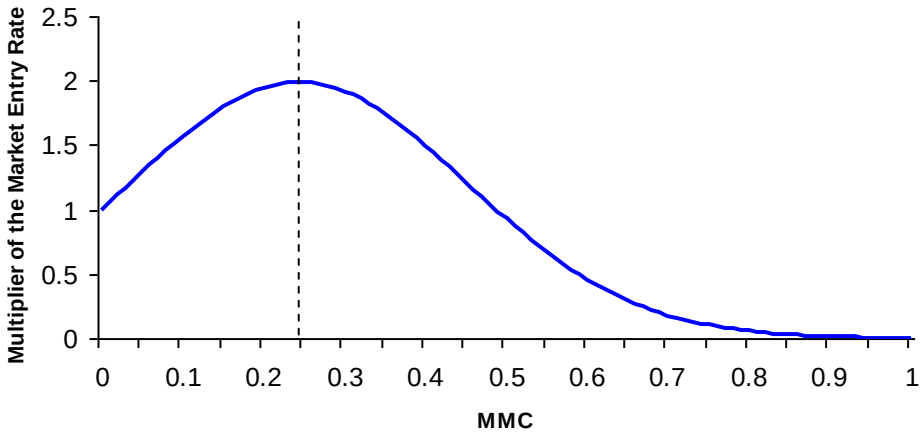


Figure 6.3 – Relationship between multimarket contact and market entry rates

Model 5 adds performance above and below aspiration level and shows a negative but insignificant effect. However, the linear and quadratic terms for MMC remained significant. Model 6 adds the interactions of slack and performance relative to aspiration level and shows that the estimates became significant. The effect of performance below aspiration level on entry rates is positive for low-slack firms and negative for high-slack firms. Similar to the pattern of

[4] The threshold is calculated as the point where the first partial derivative of equation 5.9 with respect to multimarket contact is equal to zero.

nonsignificant effects found in model 2, the lack of significance in model 5 was due to a blending of two opposite effects for firms with different levels of slack. The log-likelihood for Model 6 was -7,097.65, which indicates a significant improvement in fit to data over either Model 3 (behavioral antecedents only, -7,256.31) or Model 4 (competitive antecedents only, -7,225.96). Moreover, the estimates for the coefficients were significant and consistent with both the shifting-focus model and mutual forbearance predictions. This pattern of results suggests that behavioral and competitive antecedents together explain market entry behavior better than each set of antecedents individually.

Models 7 and 8 in Table 6.4 present results for the interactive effects of behavioral and competitive antecedents, and enables me to test Hypotheses 1a, 2a, and 3a. Model 7 adds the interactions of MMC with performance above and below aspiration level. The coefficients on both interactions are nonsignificant and the linear and quadratic terms for MMC became nonsignificant. However, the coefficients on the interactions of slack and performance below and above aspiration level remained significant.

Model 8 adds the three-way interactions of MMC with slack and performance above and below aspiration level. The coefficients on the interaction of MMC and performance below aspiration level now became significant. Similar to the patterns of results in Models 2 and 5, these results again suggest the nonsignificant effects in Model 7 were due to a blending of two opposite effects for firms with different levels of slack.

Table 6.4 – Behavioral and Competitive Antecedents of Market Entry (Interactive Effects)

Variables	Model 7		Model 8	
Market concentration	0.62 ***	(0.08)	0.62 ***	(0.08)
Market density	0.20 ***	(0.02)	0.20 ***	(0.02)
Market density squared	0.00 ***	(0.00)	0.00 ***	(0.00)
Market attractiveness	0.02	(0.04)	0.02	(0.04)
Firm size	-0.11	(0.11)	-0.11	(0.12)
Mutual	-0.70 **	(0.23)	-0.70 **	(0.23)
Firm's market experience	0.03 ***	(0.01)	0.03 ***	(0.01)
Firm's entry experience	0.03 ***	(0.01)	0.03 ***	(0.01)
Performance above asp. Level	-7.16 **	(2.21)	-7.34 **	(2.18)
Performance below asp. Level	3.77 *	(1.79)	4.17 *	(1.74)
Slack	-1.40	(1.13)	-1.52	(1.12)
Performance above asp. level * Slack	15.99 ***	(4.44)	16.37 ***	(4.38)
Performance below asp. level * Slack	-13.10 ***	(3.47)	-14.00 ***	(2.93)
MMC	3.76	(2.94)	0.74	(3.67)
MMC squared	-9.88	(6.96)	-10.13	(6.90)
MMC * Performance above asp. Level	-4.52	(5.58)	-4.94	(18.94)
MMC * Performance below asp. level	3.64	(5.10)	-22.30 **	(8.52)
MMC * Slack			12.43 †	(7.91)
MMC * Performance above asp. Level * Slack			-1.83	(35.14)
MMC * Performance below asp. level * Slack			58.55 **	(19.78)
Observations	55,963		55,963	
Likelihood ratio chi-square (df)	470.98 (18)		598.06 (20)	
Probability > chi-square	0.00		0.00	
Log-likelihood	-7,092.81		-7,080.34	
Log-likelihood ratio chi-square	599.24 ***		624.19 ***	

Robust estimates of standard errors are in parentheses.
† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$
Log-likelihood ratio chi-square is relative to Model 1

Recall that the amplifying effect as predicted in hypothesis 1a requires a positive sum of the coefficients on the two-way and on the three-way interactions, that is to say, $(MMC_{t-1} \times PerfBelowAsp_{t-1})$ + $(MMC_{t-1} \times PerfBelowAsp_{t-1} \times Slack_{t-1})$ > 0. The sum of the coefficients is positive and significant (58.55 + (-22.30) = 36.25, p < 0). Therefore, H1a is supported.

To clarify this complex interaction, I graphed the effect of MMC on market entry rates over the observed range of MMC and calculated multipliers at three increasing levels of slack (μ, $\mu+1\sigma$, $\mu+2\sigma$), holding performance below aspiration level constant at the mean level. Figures 6.4 and 6.5 show these effects. When slack equals .45 (μ), the maximum multiplier is 1.42 at a value of .30 for MMC; when slack equals .57 ($\mu + \sigma$), the maximum multiplier is 1.88 at a value of .35 for MMC, and when slack equals .69 ($\mu + 2\sigma$), the maximum multiplier is 2.66 at a value of .40 for MMC. Therefore, for abundant-slack firms, performance below aspiration level both amplified the effect of MMC on market entry rates and pushed the threshold away from the point where it would be under normal conditions.

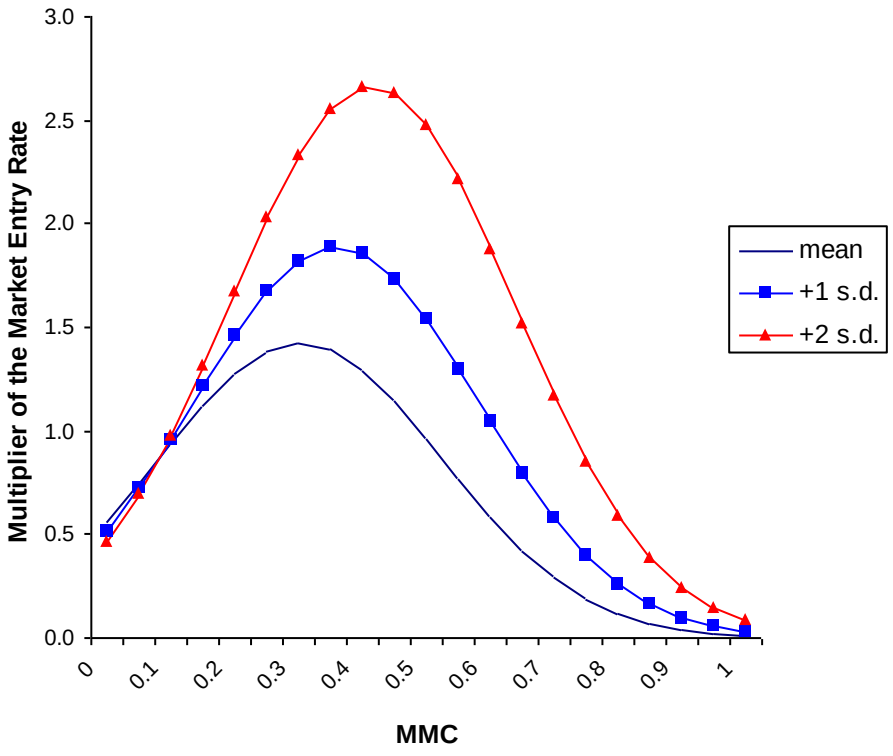


Figure 6.4 – Amplifying effect of below-aspiration performance on market entry rates of high-slack firms

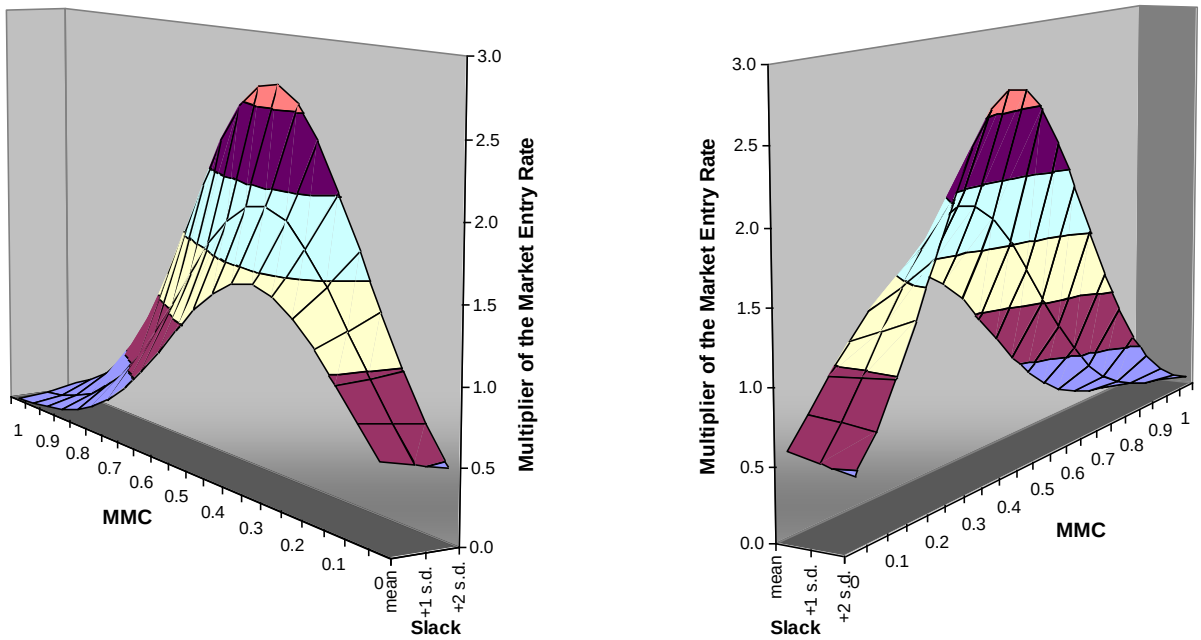


Figure 6.5 – Three-dimensional views of the amplifying effect on market entry rates

Regarding hypothesis 2a, recall that the predicted attenuating effect requires a negative coefficient on the two-way interaction $MMC_{t-1} \times PerfBelowAsp_{t-1}$. The negative and significant coefficient indicates risk aversion. Therefore, hypothesis 2a is supported.

To clarify this complex interaction, I graphed the effect of MMC on market entry rates over the observed range of MMC and calculated multipliers at three decreasing levels of slack (μ, μ-1σ, μ-2σ), holding performance below aspiration level constant at the mean level. Figures 6.6 and 6.7 show these effects. When slack equals .45 (μ), the maximum multiplier is 1.42 at a value of .30 for MMC; when slack equals .33 (μ - σ), the maximum multiplier is 1.14 at a value of .25 for MMC, and when slack equals .21 (μ - 2σ), the maximum multiplier is 0.98 at a value of .20 for MMC. Therefore, for limited-slack firms, performance below aspiration level both <u>attenuated the effect</u> of MMC on market entry rates and <u>moved the threshold to the left</u> from the point where it should be under normal conditions.

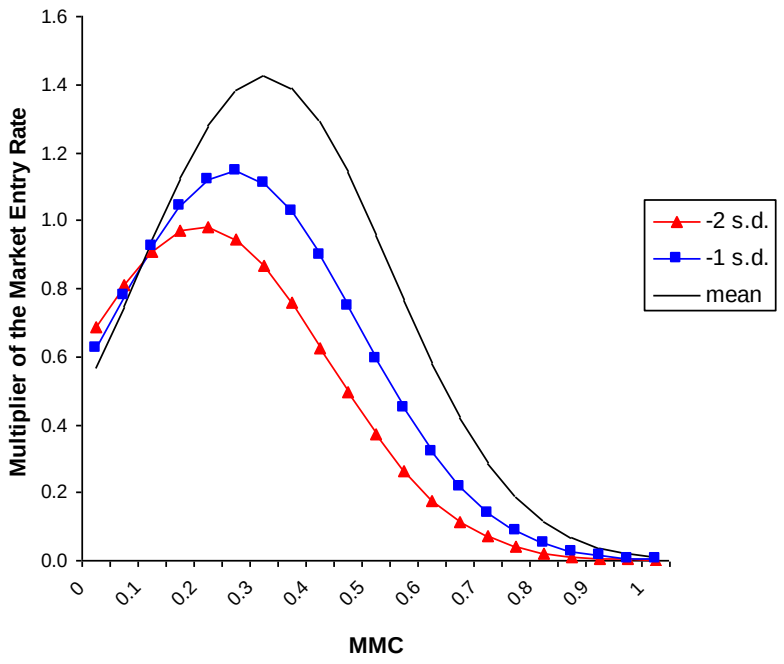


Figure 6.6 – Attenuating effect of below-aspiration performance on market entry rates low-slack firms

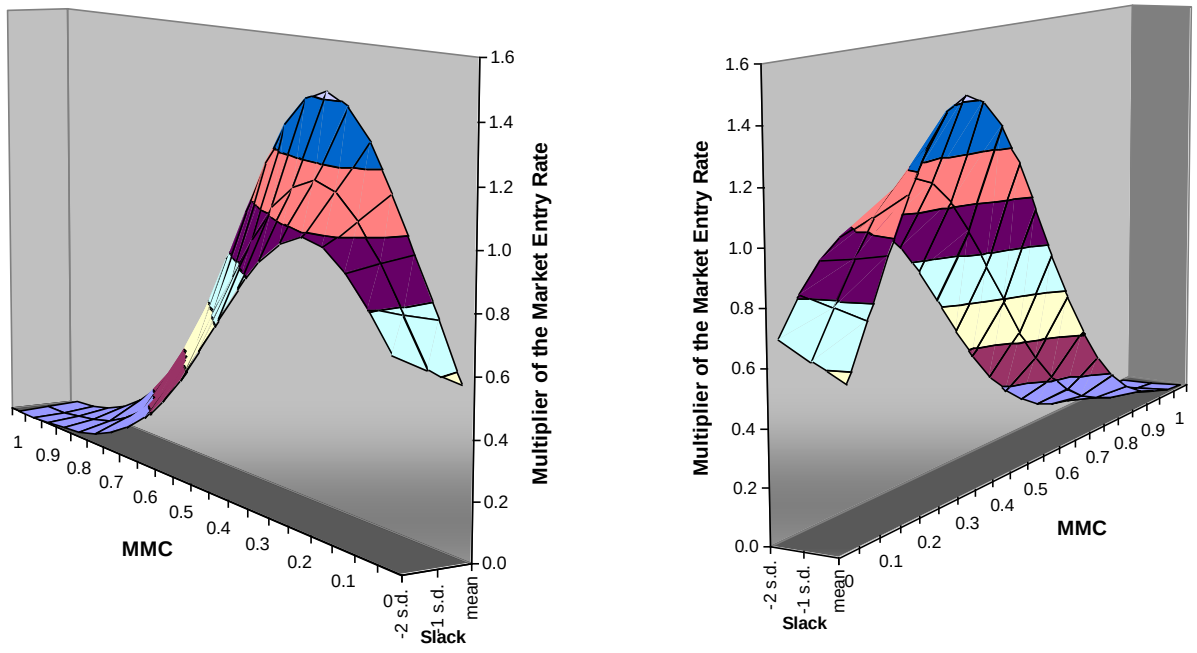


Figure 6.7 – Three-dimensional views of the attenuating effect on market entry rates

Finally, Hypothesis 3a predicts that firms performing above aspiration level do not have incentives to disrupt the multimarket structures, meaning that performance above aspiration level does not moderate the relationship between MMC and market entry. Both the coefficient on the two-way interaction of MMC and performance above aspiration level and the coefficient on the three-way interaction of MMC, performance above aspiration level and slack are not significant. Thus, hypothesis 3a is supported.

6.1.2 Market Exit

Means, standard deviations, ranges, and correlations are presented in Table 6.5. A look at the correlation matrix shows us no significantly high correlations between variables that could bias the estimates. Similar to the results for market entry, the magnitude of correlations between the explanatory variables – MMC, slack, and performance above and below aspiration level – was low, indicating that multicollinearity was not a concern.

Table 6.5 about here

Tables 6.6, 6.7 and 6.8 present the event-history analysis estimates of market exit at time *t* as a function on the firm's behavioral and competitive antecedents at time *t – 1*. Each table shows the coefficient estimates, standard errors, and tests for significance of each variable. For each model, the log likelihood statistic is given along with other statistics that indicate model fit. I also assess the multiplier effect of each statistically significant variable. The multipliers are calculated as $\exp(\beta_x)$ and describe the risk of experiencing market exit relative to the baseline hazard.

Model 1 shows the baseline model. Firms are more likely to exit from concentrated and crowded markets. An increment of one standard deviation in market concentration increased exit

rates by 3 percent. Moreover, unlike the results for market entry, firms are more likely to exit from attractive markets. An increment of one standard deviation in market attractiveness increased exit rates by 12 percent. Firms with experience in several markets and mutual firms are less likely to exit from markets. In fact, mutual firms have exit rates that are half of the rates for stock firms. Entry experience and firm size had no significant effect on exit rates.

Table 6.6 – Behavioral Antecedents of Market Exit

Variables	Model 1			Model 2			Model 3		
Market concentration	0.61	***	(0.07)	0.61	***	(0.07)	0.61	***	(0.07)
Market density	0.78	***	(0.05)	0.78	***	(0.05)	0.76	***	(0.05)
Market density squared	0.00		(0.00)	0.00		(0.00)	0.00		(0.00)
Market attractiveness	0.07	†	(0.04)	0.08	*	(0.04)	0.08	†	(0.04)
Firm size	0.06		(0.11)	0.05		(0.11)	-0.01		(0.11)
Mutual	-1.64	**	(0.67)	-1.57	**	(0.67)	-1.14	†	(0.64)
Firm's market experience	-0.01	*	(0.01)	-0.01	**	(0.01)	-0.01	**	(0.01)
Firm's entry experience	-0.01		(0.02)	-0.01		(0.02)	-0.01		(0.01)
Performance above asp. level				1.28	**	(0.76)	0.25		(1.35)
Performance below asp. level				-1.47	***	(0.41)	0.95		(0.77)
Slack							-6.76	**	(2.45)
Performance above asp. level * slack							4.95		(9.39)
Performance below asp. level * slack							-15.14	**	(6.83)
Observations	40,224			40,224			40,224		
Likelihood ratio chi-square (df)	504.64			510.67			538.59		
Probability > chi-square	0.00			0.00			0.00		
Log-likelihood	-12,294.61			-12,191.46			-11,838.28		
Log-likelihood ratio chi-square				206.29	***		912.66	***	

Robust estimates of standard errors are in parentheses.
† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$
Log-likelihood ratio chi-square is relative to Model 1

First, I test whether the March-Shapira's model is supported. Model 2 first adds performance below and above aspiration level to the baseline model. Unlike the results for market entry, performance above and below aspiration level have significant effects on market exit rates. To clarify these effects, I plotted the multiplier effect of performance above and below aspiration level on market exit rates over the observed range of performance. I followed Greve's (2003)

lead in constructing the figure. First, I set the multiplier at 1 at the origin and then varied performance below and above aspiration levels 2.5 standard deviations from the origin and computed new predicted values using the coefficient estimates of Model 2.

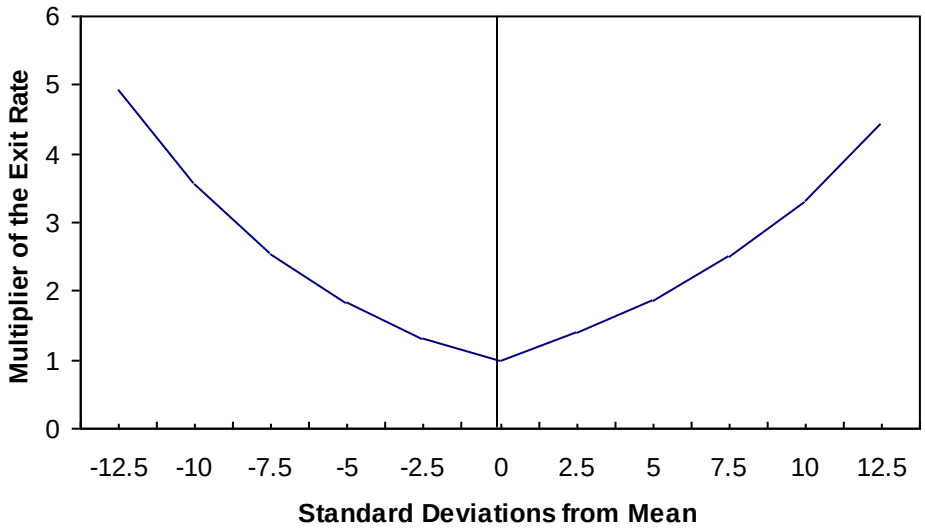


Figure 6.8 – Multiplier effect of distance from aspiration level on market exit rates

As Figure 6.8 shows, the rate of exit decreases as performance increases below aspiration level, but changes its direction at aspiration level, increasing as performance increases above aspiration level. Thus, the behavioral logic that predicts different behaviors for performance above and below aspiration level is supported.

Model 3 adds the interactions of performance relative to aspiration level and slack. Because slack is normalized, the main effect equals the effect on low slack firms and the main effect plus the interaction equals the effect on high slack firms. Unlike the results for market entry, only the coefficients on slack and on the interaction of slack and performance below aspiration level are statistically significant. Thus, March-Shapira's shifting-focus model is partially supported for market exit behavior.

Table 6.7 presents main effects of behavioral and competitive antecedents on market exit rates. Before testing the moderating hypotheses, I must test the mutual forbearance null hypothesis (H0b). Model 4 adds the linear term of multimarket contact to the baseline model and shows a negative effect of multimarket contact on market exit rates. Thus, hypothesis H0b is supported. At the average value for multimarket contact (μ = .78), the multiplier of exit rate is .33, which indicates the typical level of multimarket contact lowers exit rates by 67 percent.

Table 6.7 – Behavioral and Competitive Antecedents of Market Exit (Main Effects)

Variables	Model 4			Model 5			Model 6		
Market concentration	0.62	***	(0.07)	0.62	***	(0.07)	0.62	***	(0.07)
Market density	0.78	***	(0.05)	0.78	***	(0.05)	0.77	***	(0.05)
Market density squared	0.00		(0.00)	0.00		(0.00)	0.00		(0.00)
Market attractiveness	0.07	†	(0.04)	0.08	*	(0.04)	0.08	†	(0.04)
Firm size	0.06		(0.11)	0.05		(0.11)	-0.01		(0.11)
Mutual	-1.62	**	(0.67)	-1.54	*	(0.67)	-1.11	†	(0.64)
Firm's market experience	-0.01	**	(0.01)	-0.01	*	(0.01)	-0.01	**	(0.01)
Firm's entry experience	-0.01		(0.02)	-0.01		(0.02)	-0.01		(0.01)
Performance above asp. Level				1.28	*	(0.76)	0.14		(1.35)
Performance below asp. Level				-1.47	***	(0.41)	0.99		(0.78)
Slack							-6.85	**	(2.45)
Performance above asp. level * slack							5.64		(9.53)
Performance below asp. level * slack							-15.46	**	(6.94)
MMC	-1.41	*	(0.79)	-1.50	*	(0.86)	-1.64	*	(0.90)
Observations	40,224			40,224			40,224		
Likelihood ratio chi-square (df)	498.52			503.75			530.83		
Probability > chi-square	0.00			0.00			0.00		
Log-likelihood	-12,280.69			-12,176.61			-11,821.19		
Log-likelihood ratio chi-square	27.85	***		235.99	***		946.83	***	

Robust estimates of standard errors are in parentheses.
† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$
Log-likelihood ratio chi-square is relative to Model 1

Figure 6.9 presents this effect graphically. As multimarket contact increased from 0 to 1, the rate of market exit decreased, reaching a multiplier effect of .24, which indicates that the rate of exit at the highest level of multimarket contact is decreased by 76 percent.

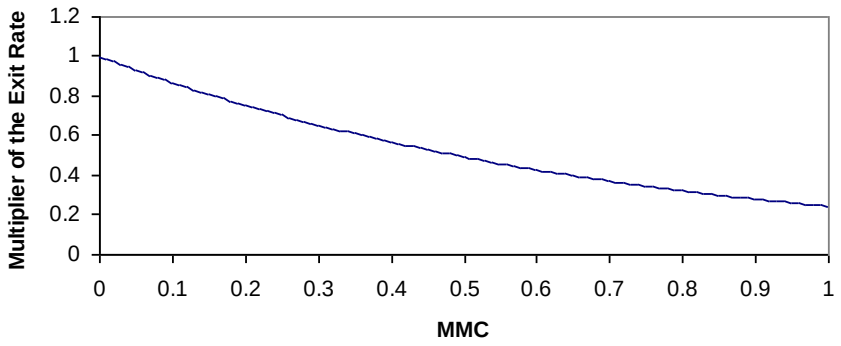


Figure 6.9 – Relationship between multimarket contact and market exit rates

Model 5 adds performance and shows a significant effect on exit rates above and below aspiration level. Performance below aspiration level has a negative estimate and performance above aspiration level has a positive estimate, a pattern similar to Model 2. Model 6 adds the interactions of slack and performance relative to aspiration level and yields coefficients similar to the ones in Model 3.

Models 7 and 8 in Table 6.8 present results for the interactive effects of behavioral and competitive antecedents. Model 7 adds the interactions of MMC with performance above and below aspiration level. The coefficients on both interactions are nonsignificant. Model 8 adds the three-way interactions of MMC with slack and performance above and below aspiration level, and enables me to test Hypotheses 1b, 2b, and 3b.

Table 6.8 – Behavioral and Competitive Antecedents of Market Exit (Interactive Effects)

Variables	Model 7			Model 8		
Market concentration	0.62	***	(0.07)	0.62	***	(0.07)
Market density	0.76	***	(0.05)	0.77	***	(0.05)
Market density squared	0.00		(0.00)	0.00		(0.00)
Market attractiveness	0.08	*	(0.04)	0.08	*	(0.04)
Firm size	-0.01		(0.11)	-0.02		(0.11)
Mutual	-1.10	†	(0.64)	-1.12	†	(0.65)
Firm's market experience	-0.01	**	(0.01)	-0.01	**	(0.01)
Firm's entry experience	-0.01		(0.01)	-0.01		(0.01)
Performance above asp. Level	-0.44		(1.55)	-0.15		(1.58)
Performance below asp. Level	1.04		(0.79)	1.01		(0.77)
Slack	-6.96	**	(2.47)	-6.87	**	(2.43)
Performance above asp. level * slack	7.75		(9.51)	6.64		(9.59)
Performance below asp. level * slack	-15.68	**	(7.00)	-15.63	**	(6.97)
MMC	-1.41	†	(0.91)	-3.48	*	(1.90)
MMC * Performance above asp. Level	-5.16		(4.76)	2.55		(7.46)
MMC * Performance below asp. Level	0.43		(2.72)	-3.34	*	(1.15)
MMC * Slack				10.30	†	(6.72)
MMC * Performance above asp. level * slack				-50.15		(36.94)
MMC * Performance below asp. level * slack				25.67	*	(14.37)
Observations	40,224			40,224		
Likelihood ratio chi-square (df)	567.91			566.72		
Probability > chi-square	0.00			0.00		
Log-likelihood	-11,816.66			-11,810.13		
Log-likelihood ratio chi-square	955.91	***		968.96	***	

Robust estimates of standard errors are in parentheses.
† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$
Log-likelihood ratio chi-square is relative to Model 1

Recall that the attenuating effect as predicted in hypothesis 1b requires a positive sum of the coefficients on the two-way and on the three-way interactions, that is to say, $(MMC_{t-1} \times PerfBelowAsp_{t-1})$ + $(MMC_{t-1} \times PerfBelowAsp_{t-1} \times Slack_{t-1})$ > 0. The sum of the coefficients is positive and significant (25.67 + (-3.34) = 22.33, $p < 0$), indicating risk seeking. Therefore, H1b is supported.

To clarify this complex interaction, I graphed the effect of MMC on market exit rates over the observed range of MMC and calculated multipliers at three increasing levels of slack (μ, μ+1σ, μ+2σ), holding performance below aspiration level constant at the mean level. As shown in

Figures 6.10 and 6.11, increasing levels of slack retard the effect of multimarket contact on market exit rates.

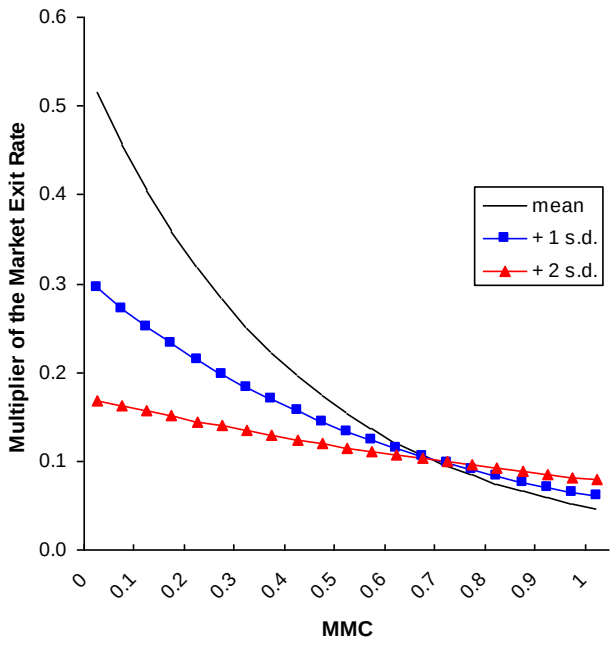


Figure 6.10 – Attenuating effect of below-aspiration performance on market exit rates of high-slack firms

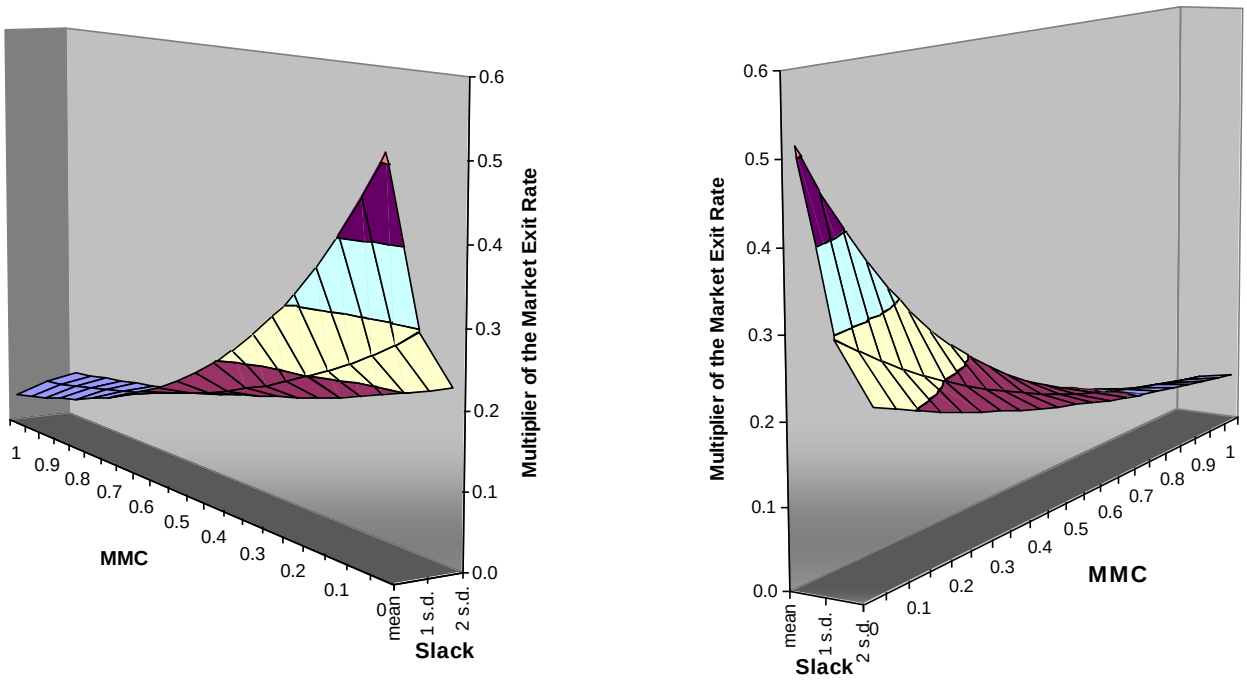


Figure 6.11 – Three-dimensional views of the attenuating effect on market exit rates

Regarding hypothesis 2b, recall that the predicted amplifying effect requires a negative coefficient on the two-way interaction $MMC_{t-1} \times PerfBelowAsp_{t-1}$. The negative and significant coefficient indicates risk aversion. Therefore, hypothesis 2a is supported.

To clarify this complex interaction, I graphed the effect of MMC on market exit rates over the observed range of MMC and calculated multipliers at three decreasing levels of slack (μ, μ-1σ, μ-2σ), holding performance below aspiration level constant at the mean level. As shown in Figures 6.12 and 6.13, decreasing levels of slack accelerates the effect of multimarket contact on market exit rates.

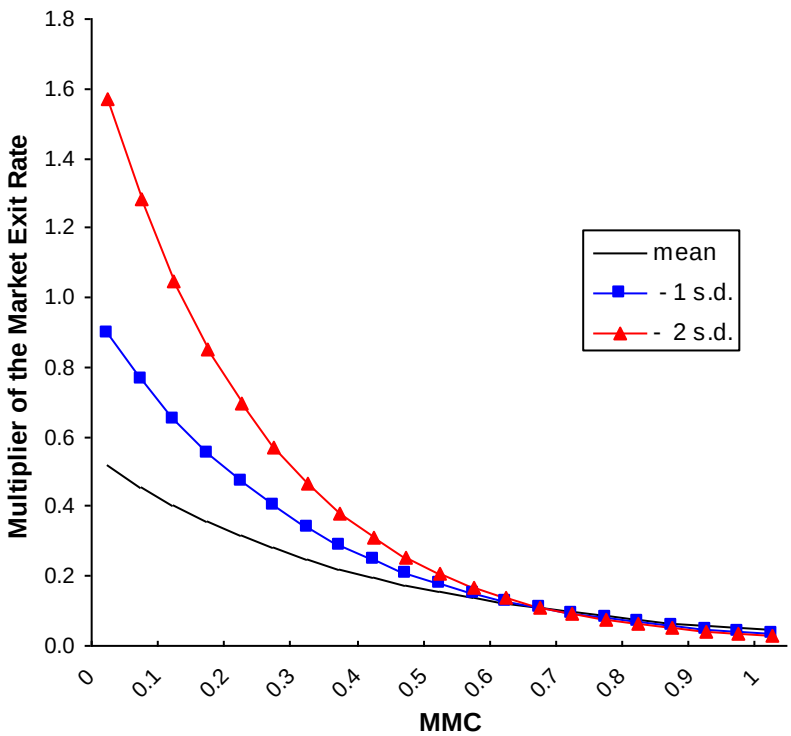


Figure 6.12 – Amplifying effect of below-aspiration performance on market exit rates of low-slack firms

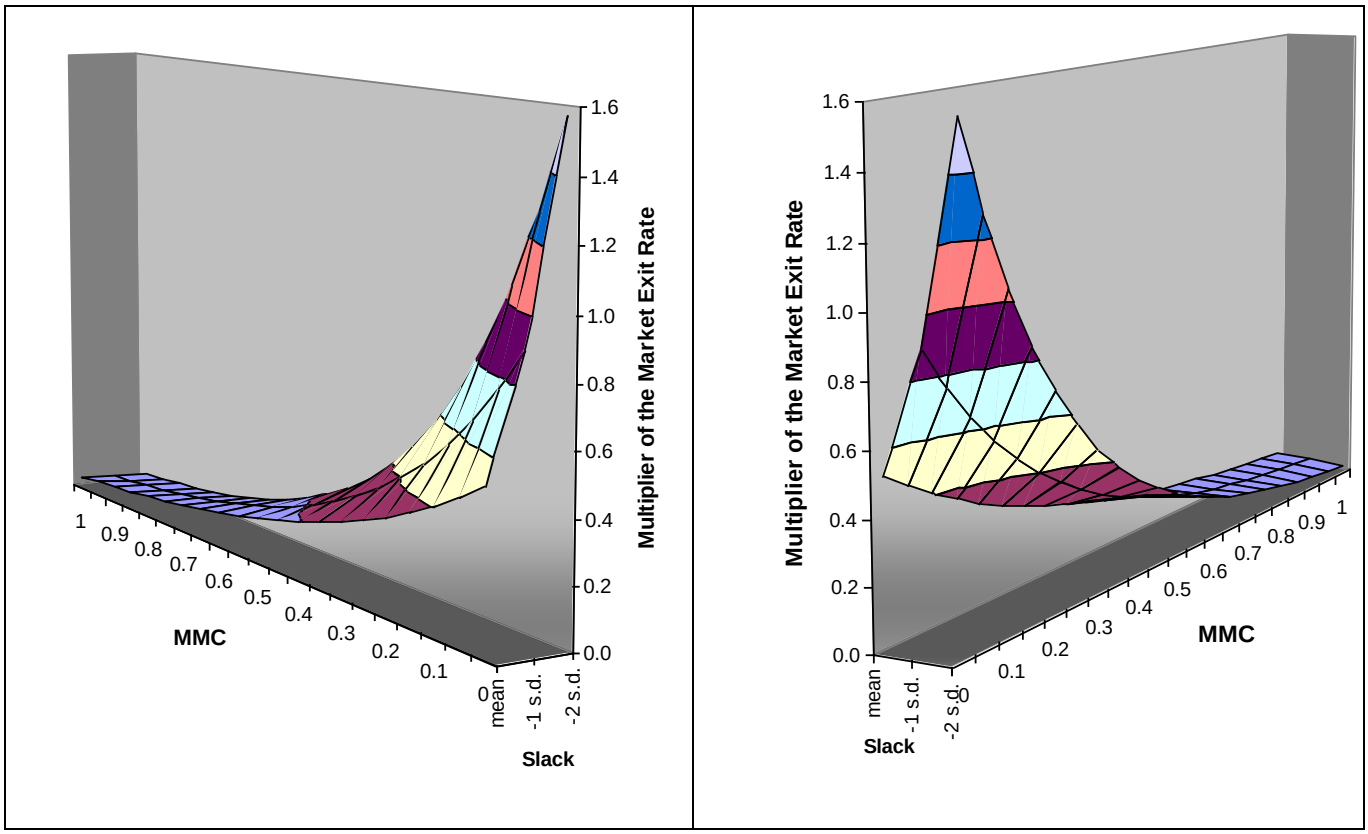


Figure 6.713 – Three-dimensional views of the amplifying effect on market exit rates

Finally, Hypothesis 3b predicts that firms performing above aspiration level do not have incentives to disrupt the multimarket structures, meaning that performance above aspiration level does not moderate the relationship between multimarket contact and market exit. Both the coefficient on the two-way and three-way interactions of MMC, performance above aspiration level and slack are not significant. Thus, hypothesis 3b is supported.

6.2 Discussion

Due to the nature of the hypothesized effects of the competitive and behavioral antecedents on corporate strategic decisions, I tested direct and moderating effects of the respective variables. Table 6.9 summarizes the findings, which are discussed in turn.

Table 7.1 – Summary of Empirical Results

Moderators	Market Entry	Market Exit
Baseline model (mutual forbearance hypothesis)	inverted-U-shaped relationship *H0a supported*	negative relationship *H0b supported*
Performance below aspiration level and high slack	amplifying effect *H1a supported*	attenuating effect *H1b supported*
Performance below aspiration level and low slack	attenuating effect *H2a supported*	amplifying effect *H2b supported*
Performance above aspiration level, irrespective of the level of slack resources	no effect *H3a supported*	no effect *H3b supported*

6.2.1 Competitive antecedents of market entry and exit

The results provide strong support for the mutual forbearance null hypotheses with respect to market entry and exit. Consistent with findings in prior research on market entry (Haveman & Nonnemaker, 2000; Baum & Korn, 1999; Stephan et al., 2003, Fuentelsaz & Gomez, 2006), insurance firms do take into account the level of multimarket contact as they enter into new markets. Between low to moderate levels of multimarket contact, firms have an incentive to build deterrence capability. The results show that entry rates first increases, up to a threshold of multimarket contact that nearly doubles entry rates. Beyond the threshold, firms recognize their extended interdependence with rivals and refrain from entering into markets with high multimarket contact, which explains multipliers close to zero at very high levels of multimarket contact.

The results for market exit complement this rationale, in that once firms establish mutual footholds with rivals, they are unlikely to abandon them. Consistent with previous studies in market exit (Barnett, 1993, Baum & Korn, 1996; Boeker et al. 1997), the results show strong support for the negative relationship between multimarket contact and exit rates. Thus, insurance

firms are more likely to exit from markets with low levels of multimarket contact than those with high levels of multimarket contact.

It is worthwhile to discuss an exception in the market exit literature. Barn and Korn (1999) is the only study that predicted an inverted-U-shaped relationship between multimarket contact and exit rates, meaning that both entry and exit follow similar patterns. In order to explain the rise in exit rates between low and moderate levels of multimarket contact, they introduced the idea of exit as an outcome of competitive interaction or, in other words, exit as a *forced strategy*. For the decline in exit rates beyond the threshold, they consider exit as a *strategic move*, applying the mutual forbearance argument. Thus, they conceptualize exit differently according to the level of multimarket contact. Because I defined market exit as a *decision* rather than an *outcome* and applied this definition across the entire range of multimarket contact, my theoretical model builds on prior research and only considers the negative relationship between multimarket contact and exit rates.

Nevertheless, I investigated the possibility of an inverted-U curve for market exit in this sample. My motivation was the fact that Baum and Korn (1999) reported contradictory findings between that study and their previous work. Baum and Korn (1996) found a negative coefficient on the linear term for multimarket contact, but, when they later added the quadratic term (Baum & Korn, 1999), the coefficient on the linear term became positive, and the coefficient on the quadratic term was negative, which indicates an inverted-U-shaped relationship between multimarket contact and exit rates. To rule out this possibility, I estimated an additional model, not shown in Table 6.7, in which I included a quadratic term for multimarket contact. The coefficient on the linear term was -3.61, which indicates that the coefficient remained negative, the coefficient on the quadratic term was -16.34, and both were significant at $p < .01$. This

pattern of results shows an accelerating decline in exit rates, which suggests that insurance firms are eager to keep the mutual footholds as the level of multimarket contact further increases. Thus, I did not find evidence of an inverted-U-curve for market exit decisions in the insurance industry.

The nature of the industry and the period of observation can possibly explain these different results. Baum and Korn (1999) found the inverted-U-shaped curve for market exit in the airline industry in a period of observation following intense deregulation, whereas I tested my hypotheses in a mature, well established industry. This suggests that competitive dynamics seems to vary across different industries and time periods. Another plausible explanation is the fact that I examined geo-product markets. This departure from a traditional focus on geographic markets presents a more complete picture of the competitive environment that managers take into account when restructuring their firm's business scope.

6.2.2 Behavioral antecedents of market entry and exit

Because the theoretical model predicted moderating effects of behavioral antecedents on the mutual forbearance logic, it was important to examine the direct effect of these variables. I tested two behavioral models. First, I tested the original variables according to the behavioral theory of the firm (Cyert & March, 1963) and the prospect theory traditions (Kahneman & Tversky, 1979): performance above and below aspiration level. Second, because the predictions for performance below aspiration level are still controversial, I tested an outgrowth of the behavioral theory of the firm – the shifting focus model of risk taking (March & Shapira 1992). This model takes into account the moderating effect of organizational context on the reaction to performance feedback. I compared the results from these two models for market entry and exit.

Regarding market entry, I found that the shifting focus model offers a better explanation for market entry activity. The original behavioral variables (performance below and above aspiration level) became significant only when the organizational context (slack) is taken into account. For performance below aspiration level, the results are consistent with previous studies that tested March-Shapira model (Miller & Chen, 2004; Audia & Greve, 2006). Because the opportunities to recover from shortfall are more salient than the dangers associated with risk taking for high-slack firms, these firms expand their business scope with distance below aspiration level. Conversely, for low-slack firms, the dangers associated with risk taking become more salient than its opportunities, preventing managers from pursuing risk. Thus, low-slack firms contract their business scope with distance below aspiration level.

Interestingly, my findings disagree with Audia and Greve (2006) for performance above aspiration level. Whereas they found that the effect of performance above aspiration level is not significant, I found that low- and high slack firms performing above aspiration level have different risk preferences: Low-slack firms are risk averse and high-slack firms are risk seeking as performance above aspiration level increases. Nevertheless, these results are consistent with Baum, Rowley, Shipilov, and Chuang (2005) findings that performance far above aspiration levels has a similar effect on risk taking as performance far below them. Similarly, Iyer and Miller (2008) found risk seeking for performance above aspiration level in a study of acquisition behavior in manufacturing industries.

In terms of exit behavior, the behavioral theory of the firm and prospect theory prediction for performance below aspiration level is supported. Exit rates increase with distance below aspiration level, which is consistent with previous studies (e.g. Shimizu, 2007). Interestingly, my

findings provide rare evidence of exit behavior when performance is above aspiration level. In such condition, exit rates increases with distance above aspiration level.

6.2.3 To forbear or not to forbear?

The theoretical model of this study predicted that performance relative to aspiration level impacts managers' risk preference, which in turn, impacts whether firms follow or deviate from the mutual forbearance logic. This argument is strongly supported across all models for both market entry and exit. The skewed curves shown in Figures 6.4, 6.6, 6.8, and 6.10 depict the competitive behavior after the introduction of bounded rationality into the rational logic of the mutual forbearance hypothesis. The results show distinct competitive behaviors when firm performance is above and below aspiration level.

Like other goals that firms pursue, abiding by the multimarket structures established with rivals is an organizational goal (Cyert and March, 1963). Firms pursue this competitive goal in order to benefit from the decreased levels of rivalry and enhanced performance that mutual forbearance provides. I found that firms are more likely to pursue competitive goals when performance goals are satisfied. This is true for firms performing above aspiration level and consistent with results from previous studies. For example, Greve (1998) found that high performing firms are less willing to abandon the multimarket strategy that generated the high performance in the first place, and more recently, Greve (2008) found that firms only attend to other goals when performance goals are satisfied. Thus, high performing firms do not have incentives to change their competitive behavior, and therefore, performance above aspiration level does not impact the forbearance-oriented market entry and exit behaviors.

The situation is quite different for firms performing below aspiration level. Low-performing firms deviate from the mutual forbearance logic because their performance goals are not satisfied. As predicted, performance below aspiration level impacts managers' risk preference, thus affecting how managers make decisions at the light of their firms' competitive environment. However, the effect of performance below aspiration level on mutual forbearance logic is contingent upon the organizational context. Abundant-slack firms perceive the discrepancy as a repairable gap, and therefore, are more likely to pursue risk in order to recover from the shortfall. Thus, performance below aspiration level for high slack firms amplifies the effect of multimarket contact on market entry and makes them take longer to forbear. On the other hand, low-slack firms perceive the discrepancy as a threat to firm survival, which induces risk aversion. Thus, resource-poor firms decrease entry rates and start forbearing sooner. Indeed, Figure 6.6 shows that for firms with very low levels of slack, entry rate almost declines monotonically with multimarket contact.

The same effects for abundant- and limited-slack firms are also found in market exit behavior. Performance below aspiration level for high-slack firms attenuates the effect of multimarket contact on exit rates, significantly reducing them. On the other hand, performance below aspiration level for low-slack firms amplifies the multimarket effect, significantly increasing exit rates. These findings are consistent with previous divestiture studies. For instance, Chang (1996) found that high-resource firms divested not as often as low-resource firms when faced with the same performance gap, and Lieberman (1990) found that resource-rich firms are able to decrease capacity incrementally when facing decline.

6.2.4 Diversification through a geo-product lens

Figure 6.15 depicts some tentative evidence of typical patterns of diversification. The figure plots the number of diversification events occurred across categories of diversification. **Geographic diversification** means previous experience in the target product market (same product market/new geographic market), and **product diversification** means previous experience in the target geographic market (same geographic market/new product market). Finally, **geo-product diversification** means experience in both the target product market (selling the same product in other geographic markets) and the target geographic market (selling other products in the geographic market).

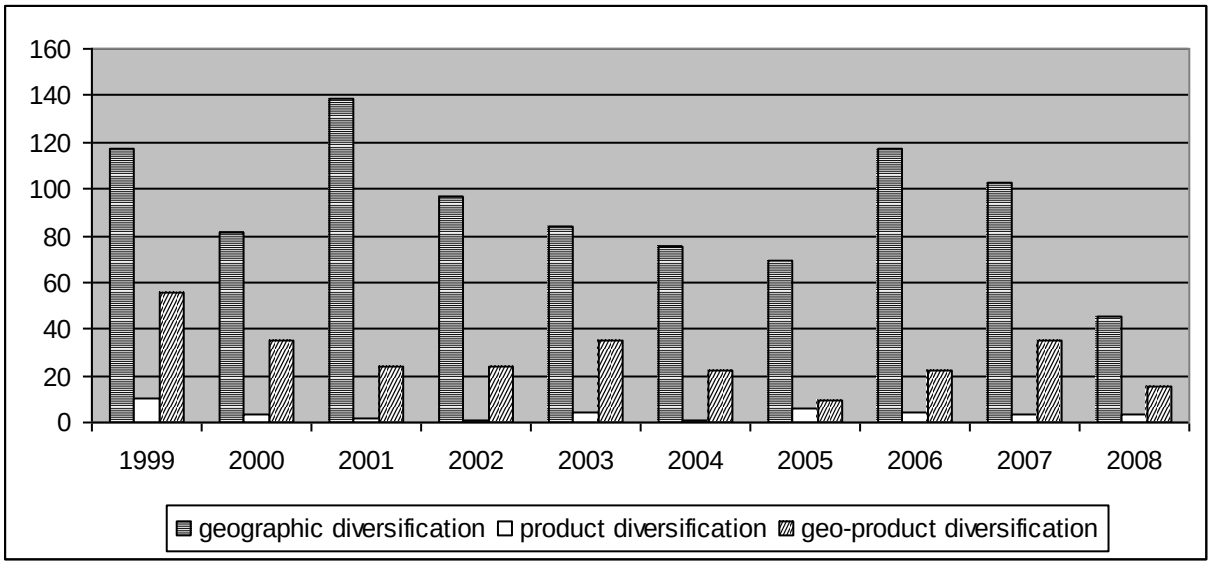


Figure 6.14 – Patterns of diversification

The figure shows interesting patterns of diversification over time. By far, firms tend to engage in geographic diversification. They have experience in the product market and expand geographically into new markets. Next, they engage in geo-product diversification, which indicates that they attempt to leverage both their product and local market knowledge. Only a

few events involve product diversification. In the context of the U.S. insurance industry, firms must have underwriting capabilities in order to write new types of insurance, and this may prevent them from diversifying into new product markets, even when they already operate in the target geographic market.

These results suggest that that product and geographic dimensions are likely to be jointly considered when managers make decisions about the firm's scope. Firms first expand into new geographic markets, perhaps because product structures are easily replicated across new geographic locations, whereas entering into new business requires knowledge about the new product. Most importantly, firms attempt to combine their product experience in other geographic markets and knowledge in the local market by engaging in geo-product diversification. This descriptive evidence demonstrates the richness of examining diversification through a geo-product lens.

CHAPTER 7 – CONCLUSION

This final chapter includes two sections. The first section discusses the theoretical, empirical, and managerial implications of this dissertation. Limitations of this study and opportunities for future research are proposed in the last section.

7.1 Implications

This dissertation has theoretical, empirical and managerial implications, which are discussed in turn.

Theoretical implications

This dissertation breaks new ground in trying to understand how firms make decisions about their scope of business in the light of their internal and external environments. I believe that I make several contributions to theory, namely by addressing: (1) the behavioral boundary conditions of mutual forbearance, (2) exit decisions, (3) geo-product diversification, and (4) the competitive antecedents of corporate strategic decisions.

First, this study challenges the completeness of our understanding of multimarket competition, due to prior research's sole reliance on rational-economic assumptions of competitive interaction. Except for a few studies (e.g. Stephan et al., 2003), the role of managers in multimarket competition research has been largely ignored. The results of this study underscore how predictions based on prior research are likely to be, at best, incomplete. For example, although the rational-economic view of mutual forbearance suggests that firms coordinate their actions in order to maximize profits, from a behavioral perspective, we know that firms avoid uncertainty (Cyert and March, 1963). In fact, because strategic management

looks at strategic decisions of *managers*, failure to incorporate a behavioral perspective into economic-rational models provides an incomplete understanding of our field. This study suggests that bringing a behavioral perspective into the theory of multimarket competition provides a more accurate picture of the competitive interactions among firms.

In a broader perspective, this dissertation responds to long-standing calls for research integrating behavioral issues into rational-economic models. As Zajac and Bazerman (1991, p. 52) noted "strategic management research may benefit from taking an integrated behavioral/economic perspective toward specific topics from the industrial organization economic literature." In the same vein, Farjoun and Lai (1997, p. 271) encouraged strategy researchers "to design theoretical models that retain the elegance of rational analysis but also incorporate the reality of bounded rationality of decision makers." The empirical evidence of this dissertation gives us an example of how our understanding can be greatly improved when integrating the rational-economic and cognitive perspectives into the same theoretical framework. Moreover, these results point to the importance of revisiting past studies. Indeed, the application of this integrative logic to other rational-economic models seems fruitful.

Second, the empirical evidence of this dissertation shows that exit is not the mirror image of entry. The dynamics of multimarket entry strategies differ in important ways from the patterns observed in the study of exit rates. Moreover, another contribution made by this dissertation is an explicit focus on under-performing firms. Across social sciences studies, there is an historical emphasis on growth-related issues (Anheier et al. 1999). Within strategy field, scholars have extensively investigated causes of above-average returns and consequences of improved performance for firms (Barney and Arikan 2001). However, a greater emphasis on expansion and

high financial performance raises serious heterogeneity issues, as understanding both causes of contraction in the scope and how under-performing firms compete should be equally relevant.

Third, this study has implications for research in geographic and product diversification. Empirical research on geographic and product diversification has largely evolved as individual streams of research. Geographic diversification has been an area of interest for international strategy scholars as they examine entry into other countries, and geographic expansion is also an important area in organization theory. In the realm of corporate strategy, the study of diversification has heavily relied on product markets, perhaps due to availability of archival data (e.g. SIC codes). Although treated as separate phenomena in the research community, these two dimensions are likely to be jointly considered when managers make decisions about the firm's scope. Hence, these dimensions have to be considered simultaneously when examining diversification. Only looking one or the other neither reflects the external market nor the way that managers view the competitive landscape. Indeed, as noted by D'Aveni (2001, p. 4)

> "At corporate and divisional headquarters or within marketing departments, managers work to stake out their product positioning on parts of the geographic space. No matter whether you are a CEO or brand manager, you compete and cooperate to win the most attractive geo-product markets, and you do so as part of a larger system comprised of many rivals with varying amounts of strong and weak territories, and hence varying degrees of power."

This dissertation attempts to capture some of this tension and struggle that managers face in organizations, contributing with a more complete picture of corporate strategic decisions.

Finally, this dissertation contributes to research on the antecedents of corporate strategy. As with any strategic decision, diversification and divestment decisions are not made in a vacuum; the competitive context in which firms are involved influence how they expand and contract their business scope. While research in corporate strategy has greatly advanced our understanding of

the role of firm-specific resources and capabilities in acquisitions and other business scope decisions, the impact of the competitive context is largely unexplored. Multimarket competition research can offer a framework for examining the influence of competitors on those decisions. For instance, a firm's acquisition or internal development of a new business unit may have motives other than excess capacity or core competences. In fact, Microsoft is currently facing this issue, as Apple's competition is forcing it to open its own retail stores (Wall Street Journal, 2009). My dissertation fills this important gap in corporate strategy literature, by showing that a multimarket perspective applied to corporate strategy provides explanations for interaction between firms that share common markets. Accordingly, I lend support to the claim that "corporate strategy decisions can only be imperfectly understood if competitive interaction is not taken into account" (McGrath, Chen, & MacMillan, 1998, p. 724).

Empirical implications

This dissertation also provides empirical contributions. The dataset I used provide depth of information regarding entry and exit behavior without resorting to changes in SIC code membership or changes in ownership (e.g. acquisition announcements and divestitures). Consequently, I was able to capture exit decisions that occurred well before a formal divestiture or dissolution would eventually occur.

My research design also successfully addresses several issues from past research in multimarket competition. First, I tested the theoretical model in a well established industry. Greve (2000) argued that future research should examine scope decisions made in other competitive contexts, focusing on recent data and on mature industries. Second, I was able to calculate multimarket contact in a meaningful way, by weighing the markets by strategic

importance. Boeker et al. (1997) suggested that markets weighed by importance better reflect the real conditions under which managers make business scope decisions. Third, by using geo-product markets, this dissertation provides a strong test of mutual forbearance logic. Taking together, these research efforts help strengthen the theoretical validity of the multimarket construct and theory.

This dissertation also contributes to research on behavioral foundations of strategic management. This study replicated Audia and Greve (2006), strengthening the validity of their results and the applicability of their method to test the March-Shapira (1992) shifting-focus of risk taking. Researchers are strongly encouraged to follow these prescriptions in studies that examine the role of organizational context in the reaction to performance feedback.

The theoretical model developed in this dissertation posed enormous challenges to research design. The model hypothesized the moderating effect of spline functions as well as the effects of two-way interactions on inverted curvilinear relationships, situations that are seldom, if ever, examined in strategic management research. Thus, this dissertation contributes with an innovative research design suitable for the study of behavioral implications of rational-economic models.

Managerial implications

This study has several managerial contributions. The results are supported by data from the service industry, that is to say, the study departs from a focus on capital-intensive industries (e.g. manufacturing, airlines) to a focus on an information-intensive industry, which is in an important sector of the economy. Managers will be better informed about how managers in *service* industries make business scope decisions at the light of their firms' competitive environment.

Indeed, some authors suggest that the competitive interaction, and, by extension, the source of competitive advantage in service and manufacturing industries might be different (Korn and Baum 2001).

For a practitioner, the results should also make one wary of relying on the original mutual forbearance predictions that competitors with high levels of multimarket contact would forbear from entering new markets. My model help managers make informed predictions about a rival's likelihood of attack in their current market domains, by showing that under-performing firms deviate from the traditional logic. Consequently, they can be proactive, outsmarting potential entrants with acquisition or internal development strategies in less targeted markets. On the other hand, managers can expect that high-performing firms will be more likely abide by the tacit agreements with competitors.

7.2 Limitations and opportunities for future research

My theory did not rely on any idiosyncratic characteristic of the insurance industry and, therefore, the theoretical predictions should generalize to other industries. However, the multiplier effects may vary across industries. Accordingly, Stephan et al. (2003) noted that the inflection point is likely to vary across industries.

Furthermore, the U.S. insurance industry is regulated at the state and federal levels, a situation that may affect the baseline hazard of market entry and exit. However, it is not clear that this would produce coefficient biases in the direction of the results.

There remains much room for future study. Studies incorporating a larger sample, a sample from different industries, or one with more control variables will certainly be invaluable for replication purposes. It would be also important that future studies follow the operationalization

of variables used in this study (e.g. multimarket contact weighted by strategic importance and normalized measures of organizational slack). This prescription would greatly advance research in this area, as researchers would be able to compare results across different empirical settings.

This dissertation has offered a behaviorally-based perspective of multimarket competition with respect to entry and exit decisions. It would be interesting to look at other aspects of competitive dynamics and see whether firms deviate from mutual forbearance predictions with respect to those decisions.

Much of the existing research in multimarket competition has relied solely on secondary and archival data sources. As a result, multimarket competition research links the observed multimarket structure to the observed market entry and exit behavior, bypassing some unobserved behavioral decision-making issues. It is fruitful that future research use primary data collected from key decision makers. This approach can provide a complement to archival approaches as it captures issues facing managers in market entry and exit decisions.

Another important extension of this study is to examine the performance consequences of the behavioral model of multimarket competition. Do risk-seeking firms that deviate from the mutual forbearance predictions enhance their financial performance? Are risk-averse firms able to survive or do they become frozen into patterns of low performance? Examination of these questions can shed light in the nature of competitive dynamics under conditions of adversity and ambiguity.

This study is among the first to examine market entry and exit across two dimensions of the firm's business scope, geographic and product markets. Because such decisions are at the core of corporate strategy, future research should examine the patterns of diversification with respect to these dimensions, as well as explore the effects of such patterns on firm performance.

To advance research, we, as researchers, are challenged to investigate and understand the nature of the interactions and interdependencies that drive collective phenomena (Morgeson & Hofmann, 1999). It is hoped that my theoretical framework and research design can help guide and inspire further work on this direction.

Table 6.1 – Descriptive Statistics and Correlations for Market Entry

	Variables	Mean	s.d.	min	max	1	2	3	4	5	6	7	8	9	10	11
1.	Entry	0.03	0.16	0	1											
2.	MMC	0.73	0.13	0.25	1.00	0.02										
3.	Market concentration	0.14	0.04	0.06	0.31	-0.02	0.22									
4.	Market attractiveness	1.61	1.34	0	10	0.02	-0.03	-0.09								
5.	Market density	35.61	9.62	12	62	0.04	-0.35	-0.44	0.21							
6.	Market experience	20.87	11.68	1	101	0.09	0.13	0.08	-0.01	-0.22						
7.	Entry experience	1.42	3.80	0	32	0.09	0.04	0.01	0.00	-0.03	0.22					
8.	Firm size	20.73	1.58	15.76	25.59	0.03	-0.04	0.04	-0.05	-0.14	0.53	0.06				
9.	Mutual firm	0.18	0.38	0	1	-0.04	0.06	0.01	0.02	0.00	0.09	-0.09	0.07			
10.	Performance above aspiration level	0.06	0.10	0.00	1.31	0.00	-0.01	-0.01	-0.03	-0.01	-0.05	0.03	0.01	-0.02		
11.	Performance below aspiration level	-0.05	0.11	-1.21	0.00	-0.01	-0.02	0.00	0.02	0.00	0.02	0.02	-0.02	-0.07	0.05	
12.	Slack	1.67	0.38	0	3.19	0.01	0.01	-0.02	0.02	0.04	-0.14	0.00	-0.01	0.14	-0.04	0.10

$|r| > .01$ implies significance at $p < .05$.
These statistics are calculated on data covering 55,963 firm-market-year observations on multimarket firms making 1,430 market entry moves between 1998 and 2008.

Table 6.5 – Descriptive Statistics and Correlations for Market Exit

	Variables	Mean	s.d.	min	max	1	2	3	4	5	6	7	8	9	10	11
1.	Exit	0.07	0.25	0.00	1											
2.	MMC	0.78	0.08	0.28	1	-0.03										
3.	Market concentration	0.14	0.04	0.06	0.31	0.01	0.23									
4.	Market density	41.48	8.47	12	62	0.00	-0.39	-0.33								
5.	Market attractiveness	1.73	1.38	0	10	0.01	-0.01	-0.05	0.22							
6.	Market experience	23.47	18.43	1	102	-0.08	-0.16	0.09	-0.15	-0.01						
7.	Entry experience	2.22	6.64	0	32	0.00	-0.04	0.01	0.02	0.03	-0.01					
8.	Firm size	22.44	1.61	15.76	25.59	-0.04	-0.07	0.03	-0.12	-0.05	0.58	-0.08				
9.	Mutual firm	0.20	0.40	0	1	-0.10	0.05	-0.01	0.00	-0.01	-0.01	-0.10	0.14			
10.	Performance above aspiration level	0.04	0.09	0.00	1.31	0.05	-0.06	-0.01	-0.02	-0.03	-0.04	0.03	0.06	-0.07		
11.	Performance below aspiration level	-0.04	0.10	-1.21	0.00	-0.10	-0.05	0.01	-0.05	-0.01	0.06	-0.05	0.02	0.07	0.21	
12.	Slack	1.55	0.27	0	3.19	-0.13	0.05	0.00	0.01	0.00	-0.22	-0.01	-0.15	0.26	0.00	0.15

$|r| > .01$ implies significance at $p < .05$.
These statistics are calculated on data covering 40,224 firm-market-year observations on multimarket firms making 1,789 market exit moves between 1998 and 2008.

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