

THE EFFECTS OF COMPETITION ON PRODUCT SEGMENT SELECTION

by

SETIADI UMAR

A dissertation submitted to the

Graduate School-Newark

Rutgers, The State University of New Jersey

In partial fulfillment of the requirements

for the degree of

Doctor of Philosophy

Graduate Program in Management

Written under the direction of

Sengun Yenyurt

And approved by

New Brunswick, New Jersey

January, 2017

©2017

SETIADI UMAR

ALL RIGHTS RESERVED

ABSTRACT OF THE DISSERTATION

The Effects of Competition on Product Segment Selection

by SETIADI UMAR

Dissertation Director:

Sengun Yeniyurt

In this research, we investigate the dynamics of firms' product segment selection, in which product positions a firm decides to enter and compete, and in which positions a firm decides to exit, from a competitive perspective. Specifically, we examine how firms make product segment selection by simultaneously considering seemingly contradictory effects: the competitive condition in a segment predicting that firms avoid competition and imitation effects that influence firms to imitate each other and to cluster together. To investigate this, we observed positional moves of firms operating in the U.S. automobile industry between 1950 and 1993 (annual panel data) with around 11,000 items of complete observations with an unbalanced time series cross sectional panel. The data recorded 723 segment entries and 627 segment exits. A discrete time event history analysis with time-varying independent variables was employed to estimate the effects of the independent variables on the probability of a company conducting segment entry or exit in a specific segment. The results suggest that although firms tend to avoid their competitors, the fear of losing market opportunity makes firms follow and imitate each other, and thus mitigate their effort to reduce the competition.

This dissertation is dedicated to my mother Kiranawati Kosasih

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to those who provided their support and assistance in completing this dissertation and receiving my doctoral degree. I would especially like to thank my dissertation advisor, Sengun Yenyurt, who has set an example of excellence as a researcher, mentor, instructor, and role model. I consider myself lucky to have had him on my side. Not only has he helped me choose my classes for the next term, but in addition he has given me much invaluable advice about academic life and life in general. He is one of the smartest people I know, and always goes out of his way to help me. He genuinely cares about his students and he always believes that they can succeed. Thank you! I really appreciate your advice and everything that you have done. I would also like to thank my dissertation committee members: Can Uslay, Chan Choi, and Goksel Yalcinkaya for all of your guidance through this process; your discussion, ideas, and feedback have been absolutely essential. I would also like to thank Frank Landsman, a bright colleague and a wonderful friend who has given me tremendous support and a big chunk of his valuable time from Indonesia. Thank you Frank! Finally, I would like to thank my mom, Kiranawati Kosasih and my sister, for their love, trust and support from afar, bright colleagues, dear friends at Rutgers Business School, who made my stay (and research) here in Newark (and New York) so enjoyable, good friends from all around the world, and all the professors from whom I learned so much from during my doctoral studies.

Thank you all.

Table of Contents

Abstract	ii
List of Tables	ix
CHAPTER ONE	1
Introduction.....	1
CHAPTER TWO	6
Theoretical Foundations and Hypotheses	6
Market Segment and Product Position.....	6
The Effect of Segment Structure on Market Segment Selection	8
Segment competitive level and market segment selection.....	8
Segment concentration and market segment selection.....	13
The Effect of Competitor Behavior on Market Segment Selection	14
CHAPTER THREE	17
Method	17
Data and Empirical Context.....	17
Defining the Boundaries of the Market Space	18
Model Specification and Estimation.....	21
Operationalization of Variables	22
Dependent variables.....	22
Covariates.	23
Segment Competition.....	23

Segment Concentration.....	23
Number of Competitor Entries.....	24
Number of Competitor Exits.....	24
Control variables.....	24
Characteristics of companies.	24
Characteristics of segments.....	25
Characteristics of industry.	25
CHAPTER FOUR.....	44
Results.....	44
The Effect of Segment Structure on Market Segment Selection	47
Segment competitive level and market segment selection.....	47
Segment concentration and market segment selection.....	47
The Effect of Competitor Behavior on Market Segment Selection	47
The Effect of Control Variables on Market Segment Selection	48
The Robustness check on Market Segment Selection Model	49
Robustness Test: The Effect of Segment Structure on Market Segment Selection	52
Robustness Test: Segment competitive level and market segment selection.....	52
Robustness Test: Segment concentration and market segment selection.	52
Robustness Test: The Effect of Competitor Behavior on Market Segment Selection	52
Robustness Test: The Effect of Control Variables on Market Segment Selection	53
The Sensitivity analysis on Market Segment Selection Model.....	54

Sensitivity Analysis – 38 Segments: The Effect of Segment Structure on Market Segment Selection.....	58
Sensitivity Analysis – 38 Segments: Segment competitive level and market segment selection.	58
Sensitivity Analysis – 38 Segments: Segment concentration and market segment selection.	58
Sensitivity Analysis – 38 Segments: The Effect of Competitor Behavior on Market Segment Selection.....	59
Sensitivity Analysis – 38 Segments: The Effect of Control Variables on Market Segment Selection.....	59
Sensitivity Analysis – 26 Segments: The Effect of Segment Structure on Market Segment Selection.....	63
Sensitivity Analysis – 26 Segments: Segment competitive level and market segment selection.	63
Sensitivity Analysis – 26 Segments: Segment concentration and market segment selection.	63
Sensitivity Analysis – 26 Segments: The Effect of Competitor Behavior on Market Segment Selection.....	64
Sensitivity Analysis – 26 Segments: The Effect of Control Variables on Market Segment Selection.....	64
CHAPTER FIVE	66
Discussion	66
Theoretical Contributions	70
Managerial Implications	73
Implications for Policy Makers.....	75

CHAPTER SIX.....	76
Limitation and Future Research Directions	76
References.....	78

List of Tables

Table 1. Descriptive Statistics.....	28
Table 2. Correlation of all variables	29
Table 3. Robustness Analysis - Descriptive Statistics	32
Table 4. Robustness Analysis - Correlation of all variables	33
Table 5. Sensitivity Analysis - Descriptive Statistics, 38 Segments.....	36
Table 6. Sensitivity Analysis - Correlation of all variables, 38 Segments	37
Table 7. Sensitivity Analysis - Descriptive Statistics, 26 Segments.....	40
Table 8. Sensitivity Analysis - Correlation of all variables, 26 Segments	41
Table 9. The Estimated Effects	45
Table 10. Robustness Analysis – The Estimated Effects.....	50
Table 11. Sensitivity Analysis (38 Segments) – The Estimated Effects.....	56
Table 12. Sensitivity Analysis (26 Segments) – The Estimated Effects.....	61

CHAPTER ONE

Introduction

How a firm determines its position relative to competitors is the central question in strategy research (e.g. Porter 1980; Rumelt, Schendel and Teece 1994). Many firms change their product positions, that is to say, they enter a new position and exit the current one over time. Firms create new products, terminate the current products, or make changes to their products, such as changing the product's price, or its specification all the time. When a firm creates a new product, terminates a product, or makes changes to its products, it may change the current product positioning at the same time, it may enter a new segment or leave the current segment (e.g. Sinkula et al. 1997, Kaul and Rao 1995). For example, when a firm increases or decreases the price of its product, its position in the market may also move up or move down at the same time.

Segment entries and exits are seen as a primary way in which firms define and redefine their market positions and establish or avoid competition with each other (Cotterill and Haller 1992; Haveman 1993a). For example, Rambler from AMC avoided a head-to-head battle with the Big Three of U.S. Automakers (Auto Editors of Consumer Guide 2007) by exiting its segment in 1955, and entering a new position by creating a smaller, cheaper but more powerful car in 1956. Other examples include the segment entry conducted by BMW by creating the BMW 8 series in 1991 to compete with Mercedes SL Roadster and Porsche 928.

Therefore, understanding position or segment selection would help us to understand how a firm selects its competitors. Examining a firm's decisions to compete in and to disengage from a particular position would reveal patterns of inter-organizational

dynamics, how firms interact with each other and how competitive signals are transmitted. Understanding position movement between segments is also potentially important to understand how the product's identity and firm's collective identities are formed, shifted, or broken. In addition, it is also important to understand position selection because entering a new position and exiting the existing one frequently involve complex investment, which is needed to overcome within-firm managerial resistance to change, to rework channel relationships, and to educate (and advertise to) consumers about the new positioning. Therefore, understanding this position movement is absolutely essential, since not only does it determine the competitive environment of the organization and have consequences for the firm's investment, it also has implications for a host of other organizational characteristics. However, the studies that connect product changes to product positioning movement are scant and empirical analyses of positioning decisions in the academic literature have also remained scarce, especially the ones that investigate competitive driven positioning. In addition, the question still remains: How do firms select their segments?

The current literature on market selection falls into two research streams. Some researchers (especially economic, organizational ecology researchers investigating market formation and dissolution) propose market structure as the determinant of both segment entry and exit. They showed that entry into or exit from a particular segment depends on the number of firms that presents and operates in the target segment (e.g. Deephouse 1999; Hannan and Carroll 1992; Haveman 1994; Head, Mayer, and Ries 2002, Alcacer, Dezso, and Zhao 2013). Supporting this point of view, competitive strategic researchers propose that the number of competitors (number of similar competitors, number of product substitutes, number of buyers, number of suppliers and number of potential entrants)

influence the firm's decision to enter or to exit a particular market. However, another stream of research argues that competitors' behavior is the determinant of both firm's entry and exit (e.g. Abrahamson 1991; Kennedy 2002). These researchers claim that firms learn from and imitate each other. Interestingly, there is data to support both arguments. For example, Haveman (1994) provided evidence of market structure by showing that market entries in U.S. savings and loan companies depend on the number of competitors that has already been operating in the market, while Kennedy (2002) investigating Prime Time Television Programming found that firms continued to imitate throughout the sample period. He found that rivals' program introductions and cancellations influence the firm's programming decision and the firm will pursue strategic actions that are similar to those rivals.

This research investigates the dynamics of product position selection, in which positions a firm decides to enter and compete, and in which positions a firm decides to exit. A key contribution of this research is that we simultaneously account for the seemingly contradictory effects predicted by segment competitive condition and by learning/imitation behavior. Segment competitive condition predicts that firms avoid competition. Firms enter and stay in segments with a low competition level, while exiting from and avoiding segments with a high level of competition. On the other hand, the imitation effect predicts that firms imitate each other and cluster together. This theory predicts that a firm's choices about which new segments to enter and which current segments to exit is determined by the movements of competitors, that is to say which position is entered or abandoned by its competitors. In this paper we propose that the decision of firms on position selection depends on competitive conditions. Managers in general want to keep competitive pressure

low by selecting and staying in segments with a low competitive level (segment with few competitors) as well as avoiding and exiting segments with a high competitive level. However, competitors' uniform movements into a particular segment incite managers' fears of missing a good market opportunity triggering imitation behavior.

The insight provided by this research would help managers to better understand the complex competitive environment as well as to better predict competitors' competitive moves and responses in the market space. The more the managers understand the market, the more realistic their prediction will be, and the less risk a company should bear. The ability to make realistic predictions is important since knowing a firm's and/or competitors' capability without the knowledge of how competitors respond can trigger a costly competitive battle. In addition, with an increased understanding of the segment selection behavior, firms can better understand their own decision – making process in segment selection, better manage their product portfolio and positions as well as making better decisions in designing and developing new products, especially in deciding what particular product's characteristics should be developed, changed and dropped.

In our approach, products with similar characteristics (e.g. price, car size, engine horsepower), are perceived as categorically similar to each other by relevant external constituents (e.g. consumers, suppliers, regulators, and the like), thus they are in the same segment and utilize the same segment resources. Depending on segment competitive condition as well as on what its competitors do, a firm may enter or exit from a particular segment. If a product is modified, that product may change its positioning, which means the modified product may enter a new segment and exit the current one. A firm may also enter or exit a segment by creating a new product or terminating the current one.

For the empirical application of our model, we examine the product modifications, new product launches, and product terminations at automotive companies operating in the U.S. market between 1950 and 1993, and see whether these activities result in position change, or in a new segment entry or exit. The automotive industry is selected since it relies so heavily on new products. In fact, the main offensive of competition in the automotive industry is product development, with each company competing by creating new product offerings, eliminating the current offerings, or modifying its product offerings almost every year. This industry is characterized by rapid change and intense competition with considerable variation in product specification and position across time. This condition enhances the variance, reliability, and meaningfulness of variables.

Our research makes the following main contributions: First we add to the important but under-researched area of positioning movement by directly investigating product modifications, new products, or product termination that result in new segment entry or segment exit. Second, a novel approach to modeling population dynamics by focusing on segment heterogeneity that enables us to study market position movement is created. This model enables us to see through the dynamics of variations, selections and retention of firm's positions. Third, deriving from the extant theoretical frameworks, testable predictions regarding the effect of segment structure and competitors' behavior on product positioning dynamics are formulated. Finally, we provide an empirical application using data from automotive industry. We find that both segment structure such as segment competitive level and segment concentration, and competitor behavior influence a firm's segment selection.

CHAPTER TWO

Theoretical Foundations and Hypotheses

Market Segment and Product Position

Researchers agree that markets are segmented or can be segmented. From the inception of the industry, perceptions of the market by consumers and manufacturers alike have been shaped by the presence of market segments (Fairén 1996, 146). The concepts of market segmentation have long been discussed in the literature. One of the pioneers of marketing thought (Shaw 1912) discussed the need to treat each distinct geographic region as a separate distribution problem. He emphasized as equally important the recognition of economic and social market “contours” or segment analysis and the need to treat these as separate market problems as well. There is a distribution of preference functions or value systems across the consumer population (Rosen 1974; Lancaster 1979). However, although the distribution of consumers’ preferences, values, ideal points, and product characteristics are continuous, the distinctions between market segments are categorical (Zuckerman 1999). According to Samuelson (1976), market segments are fragments of industry demands. Under the condition of demand heterogeneity, it may be possible to view the total market as a set of submarkets or segments whose intra-group differences would be relatively small in comparison with the inter-group differences (Dickson and Ginter, 1987). In addition, these fragments or market segments are relatively unaffected by changes in the prices of products in different segment (Porter 1976). A market can be divided by two dimensions: horizontal and vertical. Horizontal segmentation is based on the premise that customer taste varies across the population and that product variety is required to satisfy this variation. Vertical segmentation refers to a characteristic that is regarded as beneficial

by all the customers (such as quality), yet their willingness to pay for it varies (Lancaster, 1971). In vertical market segmentation, price plays a crucial role by influencing the customer perceptions regarding product attributes such as quality (Hauser and Simmie, 1981).

Different buyers' preference results in a set of different demand curves or market. To attract a group of buyers who have a different preference, manufacturers will either adapt their current products to the needs and tastes of this group of buyers (Chamberlin, 1965; Shaw, 1912; Rosen, 1974; Lancaster, 1979) by changing product characteristics and other elements of the marketing mix (Porter 1976, Sinkula et al., 1997) or create a new product with different characteristics suitable for the needs and tastes of this group of buyers (Kaul and Rao, 1995). Therefore, product characteristics can also be defined as the marketplace condition. If the product class were a commodity, all characteristics of products would be equal or perceived to be equal in terms of all elements of the vector price and both physical and non-physical product characteristics. When all products are not perceived as equal in each of the product characteristics (including price), this means that the market is segmented or can be segmented, and that firms can move between market segments or modify segments served by modifying their product characteristics. For example, Coca Cola creates Classic Coke, New Coke, Cherry Coke, Vanilla Coke, Coke Zero, Diet versions of Coke, Caffeine-free versions of Coke, Caffeine-free Diet versions of Coke to cater to different segments, and this strategy appears to have worked to the extent that CocaCola's overall market share has grown. Firms that utilize same market segment or are in the same position produce similar outputs, and are perceived as being in

the same category or segment by relevant external constituents (e.g. consumers, suppliers, regulators, and the like).

Entering a new or a different position and exiting the current one require an understanding of the factors that influence managerial decision-making with respect to segment selection, namely a decision to select which segment to enter and which segment to abandon. In this research, while we assume that consumer preferences are given, the firm's decision to serve or to leave a particular segment is influenced by the competitive condition in that particular segment and by the competitors' behavior. We expect that both segment conditions and competitor behavior play equally important roles and are highly relevant for this decision making - thus they are integrated into the conceptual framework to provide a conceptual foundation that can explain market segment selection and to serve as the base of our hypotheses.

The Effect of Segment Structure on Market Segment Selection

Segment competitive level and market segment selection.

Extant research has found that segment selection depends on the competitive level of a segment, namely the number of firms that presents and operates in a segment (e.g. Deephouse 1999; Hannan and Carroll 1992; Haveman 1994; Hannan and Freeman 1989). While the number of competitors is the proxy for competition intensity, product characteristics similarity defines who the competitors are. Then in a multiproduct firm, the firm's products dependant on their characteristics and positions in market segments may not face uniform competition intensity, since each product may compete with a different number of competitors that have products with similar characteristics with the focal firm's product or are in the same market segment.

Studies have found that choosing a segment involves a severe informational problem (e.g. Greve 1998). For new market segments, there is a little basis for guessing the resource base, causing great uncertainty about the consequences of using them. Market segments are difficult to evaluate not because of too little information, but rather because of too much and information that is unreliable (Burt 1987). Often there is no shortage of new ideas being promoted, but little is known about how well they work in practice. The search for useful and hard-to-find information becomes a task of critical importance to decision makers (Stinchcombe 1990), yet they are also constrained by what information can easily be collected and the cost of collecting it. In the absence of this hard-to-get data, managers often have to rely on the second best kind of information: whether others have adopted or not (Mansfield 1961). The presence of rivals indeed lowers the perceived risk surrounding any segment entries (e.g. Guillen 2002). Firms in a given segment increase the segment's prominence with respect to transaction partners such as customers and suppliers providing a legitimization to the segment. The more firms in a segment there are, the more legitimate that segment will be.

In addition, the presence of peers engaged in efforts to promote similar products, compounds the returns to a firm's own such efforts, even if this process occurs unintentionally (DiMaggio 1988, North 1990). These drive the segment demand up by favorably shaping consumers' preference and thus increasing the total resources available in the segment and segment's attractiveness, inducing more firms to enter the segment. A study of the Texas lodging industry, Chung and Kalnins (2001) found that agglomeration of chains affiliated and larger hotels heightens demand (particularly in rural markets) and raises the revenue per room of independent hotels.

Finally, a certain level of the presence / number of firms, by helping legitimize a new product and buffer the resources needed to maintain that product, raises the survival chance of a new product (Dobrev and Kim 2006). Mata, Portugal, and Guimaraes (1995) have also found that new plants are likely to survive longer in growing industries.

Therefore, a higher number of firms taking a position in a segment will lower the perceived risk of that segment, increase that segment's prominence, legitimation, that segment demand, as well as raise the survival chance of the firm's new product. This means that each additional firm taking a position in a segment increases the attractiveness of that segment, thus drawing other firms to enter that segment. The outcome of research conducted into the field of microeconomics (industrial organization) also supports the necessity of firms' presence in a segment to attract entries (e.g. Ilmakunnas and Topi 1999).

However, as more companies position their products in a certain segment, the competition in that segment also becomes fiercer. As more firms enter a segment, and thus increase the competitive intensity in that segment, the segment becomes less attractive due to increased fragmentation and jockeying for position (Porter 1980) and capital is more productively used in alternative segments than in the overcrowding one.

Researchers (especially in the field of organization ecology) have documented a non-monotonic effect of the number of organizations in a segment on the rate of market entry. They found an inverted U-shaped relationship between a segment's competitive level or the number of firms in a segment and the rate of entry into it. This relationship has been documented numerous times (e.g. Carroll and Hannan 2000, Baum and Amburgey 2002, and Baum and Shipilov 2006 providing reviews). Empirically, Haveman (1994) provided evidence of the relationship between the number of firms in a market and market

entry into it in the U.S. savings and loan companies. Dobrev and Kim (2006) also found that at a high competitive level, entrants would be less likely to enter that segment

Accordingly, we also posit a diminishing effect on a firm's likelihood to enter. We hypothesized that the greater the number of firms gathered in a segment, the more likely the firm would be to select that segment to be entered. In addition, at low levels, the threat of competition would not discourage firms to invest in the segment. However, this effect is offset by the increased competition effect within the segment, making the focal firm more reluctant to select that segment to be entered, especially if the segment is crowded. This situation implies an inverted U shaped relationship between a segment's competitive level and a firm's tendency to enter the segment. Therefore, we hypothesize:

H1: *Firms tend to enter a segment when the competition in that segment is low, and tend to avoid a highly-packed segment, creating an inverted U-shaped entry tendency to the number of firms in that segment*

A parallel argument can be made for segment exit rates by assuming that exit is proportional to segment competition and inversely proportional to segment viability (Hannan and Carroll 1992). When the density in the segment is low, rising segment density discourages exits from that segment. As the growing segment will lower the perceived risk of that segment, increase that segment's prominence, legitimation, demand, as well as raise the survival chance of the firm's new product, the incumbent firms are more reluctant to leave the segment until the segment becomes sufficiently tightly packed for the competition effects take the reverse direction.

At a high competitive level, additional rivals make the segment become more and more difficult to defend. For firms focused on customers, gaining an additional market

share becomes harder and the risk of losing existing share is greater. There would be a greater demand and competition for specific materials and labor required to fulfill the segment's need, driving up the cost of doing business. An additional investment is unwarranted – capital is more productively used in alternative segments, and thus the firm is unlikely to maintain its commitment, and as the competition increases even more, the company is more likely to select that segment to be exited to reduce the competitive pressure experienced by that focal firm (Dobrev and Kim 2006, Hannan and Freeman 1989, Barnett 1990). Empirical research from microeconomics field (e.g. Ilmakunnas and Topi 1999) found that an increase in the number of firms increases industry size, which in turn is related to higher exit rates. Findings in organizational ecology also support this notion. When the competition is tough, when too many companies are trying to exploit a segment, the focal firm often attempts to leave the segment, in order to avoid competition, to lower mortality risks, and to enhance growth possibilities. Firms operating in tightly packed segments will try to lighten the competitive pressure by exiting the current segment.

Researchers (especially in the field of organization ecology) have also documented a non-monotonic effect of the number of organizations in a segment on the rate of market exit. They found a U-shaped relationship between a segment's competitive level or the number of firms in a segment and the rate of exit from it. This relationship has also been documented numerous times (e.g. Carroll and Hannan 2000, Baum and Amburgey 2002, and Baum and Shipilov 2006 providing reviews).

Accordingly, we also posit an increasing effect on a firm's likelihood to exit. At low levels, the threats of competition would not encourage firms to exit from the segment, in fact the growth of the segment discourage incumbent firms to exit. However, as more

and more firms gathered in a segment, the more likely the firm would be to select that segment to be exited, especially if the segment is crowded. This situation implies a U-shaped relationship between a segment's competitive level and a firm's tendency to exit from the segment. Therefore, we hypothesize:

H2: *Firms tend to stay in a segment with a low competitive condition, and tend to exit from a highly-packed segment, creating a U-shaped exit tendency to the number of firms in that segment*

Segment concentration and market segment selection.

This hypothesis concerns the impact of segment concentration on market segment selection. A high concentration in a segment may indicate a higher upside (Aboulnasr et al. 2008) as well as profit (e.g. Porter 1980; Jacobsen 1988) in that segment. Above normal profit and higher upside potential generated by high concentration attracts entries (or an increase in capacity of the incumbent firms) (e.g. Porter 1980; Jacobsen 1988; Aboulnasr et al. 2008). Empirically, Baum and Korn (1996) showed that segment concentration has a significant positive relationship with the segment entry. In the population level, high concentration of the dominant domestic car companies (GM, Ford, and Chrysler) also attracts foreign entries to the U.S. Market. These foreign entries caused the market share of the Big Three to fall from over 90% in the mid-1950s to approximately 55% in the late 2000s (Edwards, Allen, and Shaik 2006). However, those who have entered enjoying the higher upside potential and above-normal profit are more likely to stay. We therefore hypothesize that:

H3a: *The tendency of firms to enter a segment is positively related to the concentration in that segment.*

H3b: *The tendency of firms to exit from a segment is negatively related to the concentration in that segment.*

The Effect of Competitor Behavior on Market Segment Selection

The contending theories argue that competitor behavior is the determinant of segment selection. They hold that firms learn from and imitate each other. In competition, firms tend to converge or to cluster together, and not to avoid each other. Studies found that imitative behavior appears to be common in competitive interactions among firms (e.g. Smith et al. 1992; Haveman 1993a; Fiegenbaum and Thomas 1995; Huff 1982). Many well-known examples such as the introduction of beer categories (i.e. Light, Dry, Ice, etc.), the introduction of loyalty credit card programs, and many others have been observed. Kennedy (2002) investigating Prime Time Television Programming also found that firms continued to imitate throughout the sample period. He found that program introductions and cancellations of rivals influence the firm's programming decision and the firm will pursue strategic actions that are similar to those rivals. Many innovation management researchers have noted that there are trends in businesses that easily imitated administrative technology regardless their effect on the economic performance of organizations (e.g. Abrahamson 1991; Mitroff and Mohrman 1987). They will imitate each other, creating products with similar characteristics, and competing with similar strategies (e.g. Reger and Huff 1993; Fiegenbaum and Thomas 1995; Lant and Baum 1995; Porac et al 1995). Opposing the theories mentioned above that emphasize market structure as the determinant of market and competitors selection, these researchers note that segment changes fail to reduce the competition experienced by an organization (Baum and Singh 1996; Ruef 1997).

It has been found that managers' beliefs and actions are affected by the actions of others. In fact, firms actively look for and evaluate the signals sent by their competitors for information concerning the beliefs held by their competitors concerning the market (Bikhchandani, Hirshleifer, and Welch 1998). Many studies have provided examples of firms imitating others, based solely on the manager's belief in superior information being possessed that is signaled by competitors regardless of the potential consequences (Palley 1995), regardless their own information (Bikhchandani, Hirshleifer and Welch 1992; Anderson and Holt 1997) or whether the focal firm possesses the necessary capabilities to implement the imitation or not (Lieberman and Asaba 2006; Semadeni and Anderson 2010). If a firm believes that a rival's information may be superior to its own, or information about consumers' preferences is difficult or costly to obtain and the likely actions taken by rivals are easy to observe, the firm is more likely to resort to imitation.

We posit that the competitors' movement of entering or exiting a particular segment would be observed by the focal firm. When many competitors enter or exit a particular segment simultaneously, this situation will send a strong signal to the focal firm that the segment is potentially good or bad. The more numerous competitors conducting similar movement of entering or exiting a particular segment, the stronger the signal of segment's potential success or failure (regardless whether it is true or not) and this will increase the pressure on the focal firm's manager to follow the movement of his competitors. The more competitors enter or exit a segment at a given time, the greater the perceived economic costs (possible rewards or potential costs) of not following it.

Therefore, we hypothesize that:

H4: *The more competitors moved into a certain segment in the previous year, the more likely the potential entrant will follow and gain entry into that segment, and the more unlikely the incumbent firm in that segment will be to conduct segment exit*

H5: *The more competitors exited from a certain segment in the previous year, the more likely the incumbent firm in that segment will be to follow suit and conduct segment exit, and the more unlikely it will be for the potential entrant to gain entry into that segment.*

CHAPTER THREE

Method

Data and Empirical Context

The research hypotheses presented above are tested in the context of the U.S. automotive market from 1950 to 1993 (annual panel data) with around 11,000 of complete observations with the unbalanced time series cross sectional panel. The data began to be used in the analysis a year before a company started its operation in the U.S. When a company ceases its operation, the rest of the data is treated as missing data. The unit of analysis chosen is the individual firm's actions, namely the events of new product launches, product changes and product terminations that lead into segment entries as well as segment exits for each year. The data set has been secured from a variety of secondary sources, including *The Automotive News*, *Ward's Automotive*, *the Auto Pacific Historical Battleground*, annual reports of automotive firms and *Compustat*.

The automotive industry is relevant for the test of the hypotheses for several reasons. First, the industry is characterized by rapid change, and intense competition with considerable variation in product specification and positioning across time. Second, the degree of the firm's dominance in the market segment varies across segments. Third, there are segment differences both in the number operating firm and the rate of segment growth. Fourth, there is no regulation which governs what type of cars should be made, and at what price. Firms have the flexibility and capability to alter their products to enter new segments or exit the current segments in order to respond to and to shape their competitive condition by modifying their car offerings or by creating new offerings or terminating some of their current offerings. For example, firms can create a bigger or smaller car, higher or lower

horse power, or set the price high or low. All of these make a useful setting to examine the effects of segment structure and competitors' behavior on the firms' patterns of segment selection, namely which segment to enter and which segment to abandon. Fifth, by focusing on the automotive industry, we are contributing to the cumulative knowledge gained through previous studies that utilized the same industry (e.g., Dobrev and Kim 2006; Dobrev, Kim, and Carroll 2003; Pauwels et al. 2004). Finally, apart from providing an opportunity to test the hypotheses, the automotive industry is economically interesting in its own right. The automotive Industry is one of the most important economic sectors. It happens to represent more than 3% of the U.S. gross domestic product (J.D. Power and Associates 2002), and hosts one of every seven jobs in the U.S. economy (Tardiff 1998).

Defining the Boundaries of the Market Space

Our empirical analysis models position movement of auto firms between market segments. To find natural grouping and to construct the boundaries of segments for automobiles in the U.S., we use product characteristics deemed important in differentiation by previous research. Research has identified the size of the car as the most important product characteristic in differentiation in the automotive industry (Arthur Andersen 1985). Another research study has used horse power as the proxy of technology advancement (e.g. Dobrev and Kim 2006), while many studies have focused on price as one way to differentiate the product, especially due to price and perception of quality relationships (e.g. Dawar and Parker 1994; Faulds and Lonial 2001). Although one may argue that styling has a significant impact on differentiation, it has been shown that styling changes do not pay off financially (Hoffer and Reilly 1984; Sherman and Hoffer 1971).

All of our measurements of the market space are continuous, based on an aggregate range of technologies, price, and size of cars offered annually by existing producers. Using these variables (price, technology, and size of cars), we construct the boundaries of segments for automobiles in the U.S. Since technology and price variables show a trend, if we standardize the variables for the whole period, those in the earlier period will have negative values while those at a later stage will have positive values. Therefore, in order to have a comparable unit of observations between periods as well as between variables, price and technology variables are standardized annually. This allows market segments to vary from year to year and to account for the segment shift caused by price and technological trends. For variable size, we created a factor variable covering wheelbase, length, width and weight of the car. We created this factor variable by using the extraction method of principal component analysis and then using the Varimax rotation method. All variables have factor loadings that are higher than .92 and a uniqueness lower than .15. Factor variable size was created to minimize implicit heavier weighting due to multi-collinearity in clustering afterwards. This factor variable size was standardized for the whole period since we found the size of cars to be trendless. The cars considered small-sized in the past (such as the BMW Isetta) will still be considered as small cars in the present.

We do not know *a priori* the number of segments and their seed points. Therefore, to define the technological, price, and size bounds of the market segments, the hierarchical clustering technique was used to make an initial selection. Non-hierarchical techniques such as the k-mean are known to be very sensitive to the choice of initial seeds. Simulation studies have shown that the non-hierarchical clustering algorithms perform poorly when random initial seeds are chosen (Hair et al. 1995; Sharma 1996). Using Ward's clustering

algorithm and Euclidean distance, several solutions were examined to determine the number of clusters to be extracted. The Duda and Hart (2001) $Je(2)/Je(1)$ stopping rule was used to determine the number of segments. A large $Je(2)/Je(1)$ index value and a small pseudo T-squared value indicate distinct clustering. A significant disadvantage of hierarchical techniques is that once an observation is assigned to a cluster, it cannot be reassigned to another. Therefore, the cluster seeds from the hierarchical method were used as input to the k-means method with Euclidean distance. This complements the advantages of hierarchical methods with the ability of non-hierarchical methods to fine-tune the results through the switching of cluster members (Hair et al. 1995). In order to prevent involuntary segment exit caused by this segment shift, we checked every segment exit to see whether the company exiting the segment really discontinued the product or made changes to the product in question and entered a different segment. As for segment entry, a company should create a new product or make changes to its current product, and enter a new segment in order to be coded as segment entry.

This approach is different from previous position measures used in prior analyses, in which market positions capture the distance, assuming a meaningful difference in the positions of all firms located within a segment (except when firms' positions are identical) (e.g. Dobrev, Kim and Hannan 2001; Dobrev, Kim, and Carroll 2003). Our approach, following Dobrev and Kim (2006), emphasizes the distinctions between segments rather than within a segment. We assume that products within a segment do not show significant differences from each other and between segments differences are discrete rather than continuous (Carroll, Dobrev, and Swaminathan 2002).

Model Specification and Estimation

We measured the position of each product in segments contemporaneously and focused on cases in which new products in new segments were created, or in which product changes resulted in segment changes (product positioning movement). In this way, we have been able to theorize about competition dynamics and their implications for the propensity of firms to desert or to enter a segment. We model the positional moves of firms operating in the U.S. automobile industry between 1950 and 1993 as an event history (Tuma and Hannan 1984). This approach uses data on the timing of entry/ exit to estimate the instantaneous transition rate (i.e. the hazard rate) of segment entry/ exit given a set of covariates. Since segment entry and exit are discrete phenomena, a discrete time event history analysis with time-varying independent variables is employed to estimate the effects of the independent variables on the probability of a company conducting segment entry or exit, and the logit model is the standard approach for this. Such an approach offers an assessment of the relative importance of segment structure and competitors' behaviors while accounting for any duration dependence in the data to reflect the intrinsic probability of entering or exiting in period t . The selected unit of analysis is the firm – segment–year combination, and the following logit model can be estimated:

$$\lambda_{i,m,t} = \frac{\exp(\beta_0 + \beta X_{i,m,t})}{1 + \exp(\beta_0 + \beta X_{i,m,t})}$$

where i denotes the firm, m is the potential segment market, t is the year, X is the vector of independent variables, and λ stands for the likelihood of firm i to enter segment m at time t , if the dependent variable is *Segment entry*_{imt}, and λ would stand for the likelihood of firm i to exit from segment m at time t , if dependent variable is *Segment exit*_{imt}. The vector of independent variables, except *Segment density*_{imt}, was lagged by one year. Logistic

transformation applied to this model bounds the value of dependent variable by 0 and 1, and the coefficient estimates represent the change in log-odds ratio for one unit increase in the independent variables. For the analysis, a separate record was created for each year in which the firm had the hazard of a new segment entry for dependent variable of *Segment entry*, and segment exit for dependent variable of *Segment exit*. Hence, each firm–segment pair has multiple observations across the study period. Both the dependent variables and the independent variables were updated annually for each firm–segment combination. When a segment entry (or exit) was observed, the firm–segment combination was coded as entry (or exit) and it was discontinued for the following years. The model is estimated using the maximum likelihood estimator for the traditional logit specification, which addresses right censoring and time-varying independent variables (e.g. Henisz and Delios 2001; Yeniyurt, Townsend and Talay 2007). All models were estimated in Stata 12.

Operationalization of Variables

Dependent variables. The clustering process above will automatically determine into which segment each firm’s product position falls in any given year. This research focuses on events in which a firm makes changes to its product that result in position movement, when a firm creates a new product to serve a new segment, or when a firm decides to leave the current segment. We specifically investigate the events when a firm decides to enter or to exit a segment. These are the events that define the transition rate of our model here, the dependent variables. Segment entry is the likelihood of a firm creating a new product or making changes to its product and entering a new segment at a given point in time. Segment entry is measured as a dummy variable that equals unity when a firm creates a new product or makes changes to its product to enter a new

segment and zero otherwise. On the other hand, Segment exit is the likelihood of a firm exiting a segment at a given point in time. Exiting a segment means that the firm's products are no longer exist in that segment or the firm no longer has any positions in the segment. The Segment exit is measured as a dummy variable that equals unity when a firm exits from a segment and the firm has no other products in that segment and zero otherwise. The data recorded 723 segment entries and 627 segment exits from 1950 to 1993.

Covariates. For the purpose of this study, we have four main independent variables, which are: segment competition, segment concentration, the number of competitor entries, and the number of competitor exits. All variables are time varying, and are measured at the segment level at the start of each observation year. Since we are interested in the effects of independent variables on the likelihood of a firm conducting segment entry or segment exit, we lag all independent variables (including the control variables) by one period of observation (one year) except *Segment competition*_{mt}, which is lagged for two periods of observation (two years).

***Segment Competition*_{mt}.** To test hypotheses 1 and 2, we define *Segment Competition*_{mt} for each segment as the number of competitors (number of firms besides the focal firm) serving segment *m* in year *t*. To permit the hypothesized curvilinear effects, this variable is specified as a quadratic by including both linear and squared terms.

***Segment Concentration*_{mt}.** To test hypotheses 3a and 3b, following Baum and Korn (1996), we define *segment concentration*_{mt} for each segment using the Herfindahl index for that segment at the start of each year defined as follows:

$$\text{Segment Concentration}_{mt} = \sum_{i=1}^{N_t} S_{imt}^2$$

where S_{imt} is the proportion of products in segment m produced by the firm i in year t and N_t is the total number of firms operating in segment m in year t .

Number of Competitor Entries_{mt}. To test hypotheses 4, we define *Number of Competitor Entries_{mt}* for each segment as the number of competitors (number of firms besides the focal firm) that make a new product or make changes to their products and enter segment m (conducting segment entry to segment m) in year t . Before entering, those firms did not have any positions / products in segment m .

Number of Competitor Exits_{mt}. To test hypotheses 5, we define *Number of Competitor Exits_{mt}* for each segment as the number of competitors (number of firms besides the focal firm) that exit from segment m (conducting segment exit from segment m) in year t . Exiting a segment means the firm no longer has any positions in segment m .

Control variables. To rule out plausible alternative explanations, we control the characteristics of the company, segment, and industry that may influence the segment entry and exit rates of companies. All control variables are time-varying and are measured at the start of each observation year.

Characteristics of companies. To control the effects of firm's rigidity on the firm's segment entry or segment exit (e.g. Thornhill and Amit 2003; Baum and Korn 1996; Hannan and Freeman 1984), we include the *firm's age_{it}* defined as the natural logarithm of the number of years since the year of the firm i was founded to year t and the *firm's size_{it}* measured as the number of products the company i has in year t . The variable *firm's size_{it}*

is also useful to control the effects of a firm's financial position on the firm's segment entry or segment exit (e.g. Mowery and Rosenberg 1998). We use natural logarithms for the variable *firm's age_{it}* since previous studies suggest that this transformation best represents the functional form of duration dependence in exponential models (e.g. Baum and Korn 1996). To control the effects of product variety the firm *i* has (e.g. Sorenson 2000) as well as the effects of firm's type (i.e. generalist or specialist) on the firm's segment entry or segment exit, we include *product breadth_{it}* defined as the number of segments entered by the focal firm in year *t*. Finally, to control the effects of momentum and past entry experience that the firm *i* has in segment *m* on the firm's segment entry or segment exit (e.g. Masso, Rõigas, and Priit 2014), we also include *entry experience_{imt}* defined as the number of previous segment entry and re-entry activities conducted by the firm *i* in the segment *m* in year *t*.

Characteristics of segments. To control the effects of segment's resources as well as company sales in a segment, we create *segment sales_{mt}*, defined as the total unit sales of companies that position their products in segment *m* in year *t* (logged to normalize the distribution).

Characteristics of industry. To control the effects of business failure (e.g. Ilmakunnas and Topi 1999), we include *competitor's exit_t*, defined as a dummy variable identifying the year (*t*) when a company exits the automotive industry. In addition, we also control the effects of new businesses in the automotive industry by including *new competitor's entry_t*, defined as a dummy variable identifying the year (*t*) when a company enters the automotive industry. Finally, since the capacity of an environment to support automotive industry is likely to influence segment entry and exit (i.e. the bigger the market

size, the more segments can be created, the more likely firms create new segments and conduct segment entries (e.g. Ilmakunnas and Topi 1999). We include US *Population_t*, defined as total population in the United States of America in year t (logged to normalize the distribution) and US *GDP growth_t* and *GDP decline_t*, defined as percentage of US GDP growth and decline in year t as control variables. All independent variables, except *Segment density_{mt}*, was lagged by one year. *Segment density_{mt}* was lagged by two years.

The descriptive statistics of the covariates can be found in Table 1, and their correlation can be found in Table 2. Some segments contain only one company, or some companies create products with unique characteristics. Therefore, we create another data set that excludes the segments containing only one company to check the robustness of our analysis. The descriptive statistics of the covariates for robustness analysis can be found in Table 3, and their correlation can be found in Table 4.

We also performed sensitivity analyses to test if the products in the market are more similar to each other, or if there are fewer segments in the market, or if the segments are larger than we thought. To conduct these sensitivity analyses, another two data sets were created. The first one clustered the products into 38 groups, while the second one grouped the products into 26 segments. Thirty-eight segments and twenty-six segments were chosen since they provide decent combination of Duda and Hart (2001) index values. A Large $Je(2)/Je(1)$ index value and a small pseudo T-squared value indicate distinct clustering. The former data set (the one that has been classified into 38 segments) has a $Je(2)/Je(1)$ index value of 0.707 and a pseudo T-squared value of 71.75, while the latter (the data set classified into 26 segments) has a $Je(2)/Je(1)$ index value of 0.652 and a pseudo T-squared value of 83.87. The original data set, the one classified into 46 segments has a $Je(2)/Je(1)$

index value of 0.805 and a pseudo T-squared value of 79.55. The data sets used for these sensitivity analyses contain fewer observations since our model used the firm–segment pair combination as our unit analysis. The fewer the segments in the market, the fewer our observations would be. The descriptive statistics of the covariates for this sensitivity analysis can be found in table 5 through table 8. The descriptive statistics of the covariates for the data set containing 38 segments can be found in Table 5, and their correlation can be found in Table 6, while the descriptive statistics of the covariates for the data set containing 26 segments can be found in Table 7, and their correlation can be found in Table 8.

Table 1. Descriptive Statistics

Variables	Observation	Mean	S.D.
Segment Entry _{imt}	31108	0.023	0.151
Segment Exit _{imt}	31108	0.020	0.141
Segment competition _{mt} (lagged 2 years)	31108	1.357	1.497
Segment competition _{mt} squared (lagged 2 years)	31108	4.081	8.423
Segment Concentration _{mt}	31108	0.444	0.399
Number of Competitors Entry _{mt}	31108	0.360	0.655
Number of Competitors Exit _{mt}	31108	0.316	0.621
ln (Company's age _{it})	31108	3.710	0.568
Company's size _{it}	31108	7.810	10.364
Product breadth _{it}	31108	3.981	3.527
Entry experience _{imt}	31108	0.349	0.897
ln (Segment sales _{mt})	20258	11.303	1.975
New Competitor entry _t	31108	0.274	0.446
Competitor exit _t	31108	0.250	0.433
ln (US Population _t)	31108	19.168	0.143
US GDP Growth _t	25402	3.437	2.085
US GDP Decline _t	25402	0.102	0.354

All independent variables are lagged by one year.

Table 2. Correlation of all variables

	Segment Entry _{imt}	Segment Exit _{imt}	Segment competition _{mt}	Segment competition _{mt} squared
Segment Entry _{imt}	1.000			
Segment Exit _{imt}	-0.029	1.000		
Segment competition _{mt}	0.008	0.052	1.000	
Segment competition _{mt} squared	0.030	0.050	0.941	1.000
Segment Concentration _{mt}	-0.101	-0.028	-0.818	-0.636
Number of Competitors Entry _{mt}	0.013	0.032	0.518	0.477
Number of Competitors Exit _{mt}	0.027	0.055	0.160	0.157
ln (Company's age _{it})	0.040	0.040	0.063	0.072
Company's size _{it}	0.115	0.096	-0.035	-0.015
Product breadth _{it}	0.137	0.099	-0.026	-0.007
Entry experience _{imt}	0.282	0.210	0.050	0.080
ln (Segment sales _{mt})	0.050	0.027	0.501	0.410
New Competitor entry _t	-0.006	-0.013	0.027	0.019
Competitor exit _t	0.000	0.009	0.063	0.066
ln (US Population _t)	0.014	0.036	0.291	0.266
US GDP Growth _t	0.001	-0.017	-0.046	-0.049
US GDP Decline _t	-0.004	-0.012	0.001	-0.002

Table 2. Correlation of all variables (Continued)

	Segment Concentration _{mt}	Number of Competitors Entry _{mt}	Number of Competitors Exit _{mt}	ln (Company's age _{it})
Segment Entry _{imt}				
Segment Exit _{imt}				
Segment competition _{mt}				
Segment competition _{mt} squared				
Segment Concentration _{mt}	1.000			
Number of Competitors Entry _{mt}	-0.428	1.000		
Number of Competitors Exit _{mt}	-0.123	0.109	1.000	
ln (Company's age _{it})	-0.078	0.037	0.052	1.000
Company's size _{it}	-0.031	-0.008	0.004	0.339
Product breadth _{it}	-0.043	-0.002	0.010	0.388
Entry experience _{imt}	-0.138	0.046	0.088	0.208
ln (Segment sales _{mt})	-0.532	0.203	0.097	0.016
New Competitor entry _t	-0.038	-0.015	-0.039	0.023
Competitor exit _t	-0.041	0.022	0.046	0.084
ln (US Population _t)	-0.250	0.157	0.201	0.322
US GDP Growth _t	0.029	-0.025	-0.076	-0.074
US GDP Decline _t	-0.019	-0.019	-0.045	0.047

Table 2. Correlation of all variables (Continued)

	Company's size _{it}	Product breadth _{it}	Entry experience _{imt}
Company's size _{it}	1.000		
Product breadth _{it}	0.936	1.000	
Entry experience _{imt}	0.291	0.324	1.000
ln (Segment sales _{mt})	0.008	0.011	0.104
New Competitor entry _t	0.009	0.005	-0.003
Competitor exit _t	0.026	0.033	0.037
ln (US Population _t)	0.125	0.156	0.124
US GDP Growth _t	-0.017	-0.013	-0.030
US GDP Decline _t	0.006	0.002	0.003

Table 2. Correlation of all variables (Continued)

	Biggest Segment _{mt}	Competitor exit _t	New Competitor entry _t	ln (US Population _t)
ln (Segment sales _{mt})	1.000			
New Competitor entry _t	0.038	1.000		
Competitor exit _t	-0.027	0.243	1.000	
ln (US Population _t)	0.055	0.089	0.243	1.000
US GDP Growth _t	0.020	-0.035	-0.380	-0.228
US GDP Decline _t	0.002	-0.143	-0.063	0.067

Table 2. Correlation of all variables (Continued)

	US GDP Growth _t	US GDP Decline _t
US GDP Growth _t	1.000	
US GDP Decline _t	-0.475	1.000

Table 3. Robustness Analysis - Descriptive Statistics

Variables	Observation	Mean	S.D.
Segment Entry _{imt}	29080	0.024	0.154
Segment Exit _{imt}	29080	0.021	0.144
Segment competition _{mt} (lagged 2 years)	29080	1.426	1.519
Segment competition _{mt} squared (lagged 2 years)	29080	4.340	8.652
Segment Concentration _{mt}	29080	0.447	0.392
Number of Competitors Entry _{mt}	29080	0.378	0.669
Number of Competitors Exit _{mt}	29080	0.332	0.635
ln (Company's age _{it})	29080	3.710	0.568
Company's size _{it}	29080	7.809	10.364
Product breadth _{it}	29080	3.981	3.527
Entry experience _{imt}	29080	0.364	0.913
ln (Segment sales _{mt})	19513	11.414	1.858
New Competitor entry _t	29080	0.274	0.446
Competitor exit _t	29080	0.250	0.433
ln (US Population _t)	29080	19.168	0.143
US GDP Growth _t	23746	3.436	2.085
US GDP Decline _t	23746	0.101	0.354

All independent variables are lagged by one year.

Table 4. Robustness Analysis - Correlation of all variables

	Segment Entry _{imt}	Segment Exit _{imt}	Segment competition _{mt}	Segment competition _{mt} squared
Segment Entry _{imt}	1.000			
Segment Exit _{imt}	-0.030	1.000		
Segment competition _{mt}	0.007	0.049	1.000	
Segment competition _{mt} squared	0.028	0.048	0.942	1.000
Segment Concentration _{mt}	-0.100	-0.022	-0.814	-0.632
Number of Competitors Entry _{mt}	0.013	0.030	0.516	0.474
Number of Competitors Exit _{mt}	0.025	0.053	0.147	0.148
ln (Company's age _{it})	0.038	0.040	0.064	0.073
Company's size _{it}	0.117	0.098	-0.037	-0.016
Product breadth _{it}	0.139	0.100	-0.028	-0.008
Entry experience _{imt}	0.281	0.212	0.048	0.077
ln (Segment sales _{mt})	0.050	0.022	0.496	0.409
New Competitor entry _t	-0.005	-0.013	0.030	0.021
Competitor exit _t	0.001	0.009	0.066	0.068
ln (US Population _t)	0.016	0.035	0.292	0.267
US GDP Growth _t	-0.001	-0.018	-0.048	-0.050
US GDP Decline _t	-0.004	-0.012	0.000	-0.003

Table 4. Robustness Analysis - Correlation of all variables (Continued)

	Segment Concentration _{mt}	Number of Competitors Entry _{mt}	Number of Competitors Exit _{mt}	ln (Company's age _{it})
Segment Entry _{imt}				
Segment Exit _{imt}				
Segment competition _{mt}				
Segment competition _{mt} squared				
Segment Concentration _{mt}	1.000			
Number of Competitors Entry _{mt}	-0.424	1.000		
Number of Competitors Exit _{mt}	-0.103	0.101	1.000	
ln (Company's age _{it})	-0.077	0.039	0.052	1.000
Company's size _{it}	-0.031	-0.008	0.003	0.338
Product breadth _{it}	-0.043	-0.002	0.010	0.387
Entry experience _{imt}	-0.132	0.045	0.085	0.203
ln (Segment sales _{mt})	-0.518	0.200	0.076	0.006
New Competitor entry _t	-0.042	-0.009	-0.039	0.024
Competitor exit _t	-0.044	0.026	0.048	0.086
ln (US Population _t)	-0.249	0.162	0.201	0.322
US GDP Growth _t	0.031	-0.032	-0.080	-0.074
US GDP Decline _t	-0.018	-0.017	-0.047	0.046

Table 4. Robustness Analysis - Correlation of all variables (Continued)

	Company's size _{it}	Product breadth _{it}	Entry experience _{imt}
Company's size _{it}	1.000		
Product breadth _{it}	0.936	1.000	
Entry experience _{imt}	0.302	0.334	1.000
ln (Segment sales _{mt})	0.004	0.006	0.097
New Competitor entry _t	0.009	0.005	-0.002
Competitor exit _t	0.027	0.034	0.039
ln (US Population _t)	0.125	0.156	0.124
US GDP Growth _t	-0.017	-0.013	-0.031
US GDP Decline _t	0.006	0.001	0.002

Table 4. Robustness Analysis - Correlation of all variables (Continued)

	Biggest Segment _{mt}	Competitor exit _t	New Competitor entry _t	ln (US Population _t)
ln (Segment sales _{mt})	1.000			
New Competitor entry _t	0.035	1.000		
Competitor exit _t	-0.037	0.242	1.000	
ln (US Population _t)	0.024	0.090	0.251	1.000
US GDP Growth _t	0.029	-0.033	-0.378	-0.229
US GDP Decline _t	-0.003	-0.143	-0.062	0.065

Table 4. Robustness Analysis - Correlation of all variables (Continued)

	US GDP Growth _t	US GDP Decline _t
US GDP Growth _t	1.000	
US GDP Decline _t	-0.476	1.000

Table 5. Sensitivity Analysis - Descriptive Statistics, 38 Segments

Variables	Observation	Mean	S.D.
Segment Entry _{imt}	21896	0.028	0.164
Segment Exit _{imt}	21896	0.024	0.153
Segment competition _{mt} (lagged 2 years)	21896	1.582	1.684
Segment competition _{mt} squared (lagged 2 years)	21896	5.340	10.442
Segment Concentration _{mt}	21896	0.451	0.387
Number of Competitors Entry _{mt}	21896	0.366	0.683
Number of Competitors Exit _{mt}	21896	0.322	0.646
ln (Company's age _{it})	21896	3.757	0.552
Company's size _{it}	21896	8.785	10.993
Product breadth _{it}	21896	4.277	3.307
Entry experience _{imt}	21896	0.500	1.080
ln (Segment sales _{mt})	15297	11.418	1.967
Competitor exit _t	21896	0.259	0.438
New Competitor entry _t	21896	0.257	0.437
ln (US Population _t)	21896	19.178	0.138
US GDP Growth _t	18399	3.387	2.085
US GDP Decline _t	18399	0.104	0.355

All independent variables are lagged by one year.

Table 6. Sensitivity Analysis - Correlation of all variables, 38 Segments

	Segment Entry _{imt}	Segment Exit _{imt}	Segment competition _{mt}	Segment competition _{mt} squared
Segment Entry _{imt}	1.000			
Segment Exit _{imt}	-0.032	1.000		
Segment competition _{mt}	0.024	0.057	1.000	
Segment competition _{mt} squared	0.043	0.051	0.949	1.000
Segment Concentration _{mt}	-0.103	-0.032	-0.813	-0.644
Number of Competitors Entry _{mt}	0.041	0.040	0.487	0.461
Number of Competitors Exit _{mt}	0.033	0.068	0.161	0.143
ln (Company's age _{it})	0.035	0.034	0.057	0.072
Company's size _{it}	0.089	0.069	-0.026	-0.008
Product breadth _{it}	0.114	0.073	-0.013	0.006
Entry experience _{imt}	0.295	0.211	0.036	0.070
ln (Segment sales _{mt})	0.054	0.034	0.500	0.425
New Competitor entry _t	0.011	0.002	0.033	0.033
Competitor exit _t	0.005	0.014	0.086	0.080
ln (US Population _t)	0.019	0.037	0.310	0.296
US GDP Growth _t	0.003	-0.011	-0.056	-0.053
US GDP Decline _t	-0.011	-0.012	-0.011	-0.012

Table 6. Sensitivity Analysis - Correlation of all variables, 38 Segments (Continued)

	Segment Concentration _{mt}	Number of Competitors Entry _{mt}	Number of Competitors Exit _{mt}	ln (Company's age _{it})
Segment Entry _{imt}				
Segment Exit _{imt}				
Segment competition _{mt}				
Segment competition _{mt} squared				
Segment Concentration _{mt}	1.000			
Number of Competitors Entry _{mt}	-0.403	1.000		
Number of Competitors Exit _{mt}	-0.136	0.127	1.000	
ln (Company's age _{it})	-0.066	0.031	0.041	1.000
Company's size _{it}	-0.031	-0.003	0.005	0.332
Product breadth _{it}	-0.045	0.003	0.014	0.389
Entry experience _{imt}	-0.136	0.038	0.066	0.233
ln (Segment sales _{mt})	-0.505	0.194	0.111	0.019
New Competitor entry _t	-0.022	0.041	-0.003	0.029
Competitor exit _t	-0.071	0.046	0.065	0.083
ln (US Population _t)	-0.251	0.158	0.196	0.301
US GDP Growth _t	0.046	-0.026	-0.060	-0.073
US GDP Decline _t	-0.002	-0.035	-0.041	0.050

Table 6. Sensitivity Analysis - Correlation of all variables, 38 Segments (Continued)

	Company's size _{it}	Product breadth _{it}	Entry experience _{imt}
Company's size _{it}	1.000		
Product breadth _{it}	0.934	1.000	
Entry experience _{imt}	0.344	0.369	1.000
ln (Segment sales _{mt})	0.012	0.017	0.144
New Competitor entry _t	0.019	0.030	0.004
Competitor exit _t	0.023	0.044	0.031
ln (US Population _t)	0.126	0.168	0.116
US GDP Growth _t	-0.009	-0.006	-0.020
US GDP Decline _t	0.004	-0.008	-0.001

Table 6. Sensitivity Analysis - Correlation of all variables, 38 Segments (Continued)

	Biggest Segment _{mt}	Competitor exit _t	New Competitor entry _t	ln (US Population _t)
ln (Segment sales _{mt})	1.000			
New Competitor entry _t	0.032	1.000		
Competitor exit _t	0.000	0.244	1.000	
ln (US Population _t)	0.078	0.068	0.240	1.000
US GDP Growth _t	0.009	-0.033	-0.385	-0.245
US GDP Decline _t	-0.017	-0.144	-0.063	0.070

Table 6. Sensitivity Analysis - Correlation of all variables, 38 Segments (Continued)

	US GDP Growth _t	US GDP Decline _t
US GDP Growth _t	1.000	
US GDP Decline _t	-0.478	1.000

Table 7. Sensitivity Analysis - Descriptive Statistics, 26 Segments

Variables	Observation	Mean	S.D.
Segment Entry _{imt}	14756	0.030	0.171
Segment Exit _{imt}	14756	0.025	0.155
Segment competition _{mt} (lagged 2 years)	14756	2.059	2.043
Segment competition _{mt} squared (lagged 2 years)	14756	8.413	16.380
Segment Concentration _{mt}	14756	0.461	0.357
Number of Competitors Entry _{mt}	14756	0.382	0.677
Number of Competitors Exit _{mt}	14756	0.319	0.606
ln (Company's age _{it})	14756	3.758	0.555
Company's size _{it}	14756	8.896	11.039
Product breadth _{it}	14756	3.856	2.704
Entry experience _{imt}	14756	0.546	1.040
ln (Segment sales _{mt})	11522	11.581	2.029
Competitor exit _t	14756	0.256	0.436
New Competitor entry _t	14756	0.261	0.439
ln (US Population _t)	14756	19.177	0.137
US GDP Growth _t	12362	3.408	2.092
US GDP Decline _t	12362	0.098	0.338

All independent variables are lagged by one year.

Table 8. Sensitivity Analysis - Correlation of all variables, 26 Segments

	Segment Entry _{imt}	Segment Exit _{imt}	Segment competition _{mt}	Segment competition _{mt} squared
Segment Entry _{imt}	1.000			
Segment Exit _{imt}	-0.031	1.000		
Segment competition _{mt}	0.024	0.031	1.000	
Segment competition _{mt} squared	0.028	0.025	0.951	1.000
Segment Concentration _{mt}	-0.097	-0.011	-0.769	-0.589
Number of Competitors Entry _{mt}	0.037	0.025	0.401	0.327
Number of Competitors Exit _{mt}	0.021	0.040	0.086	0.068
ln (Company's age _{it})	0.073	0.060	-0.013	0.001
Company's size _{it}	0.024	0.027	0.066	0.074
Product breadth _{it}	0.106	0.061	-0.001	0.013
Entry experience _{imt}	0.258	0.184	0.059	0.090
ln (Segment sales _{mt})	0.044	0.007	0.527	0.458
New Competitor entry _t	-0.005	-0.003	0.026	0.018
Competitor exit _t	0.009	0.006	0.104	0.086
ln (US Population _t)	0.021	0.029	0.330	0.298
US GDP Growth _t	-0.010	-0.010	-0.071	-0.069
US GDP Decline _t	0.009	-0.003	-0.004	-0.002

Table 8. Sensitivity Analysis - Correlation of all variables, 26 Segments (Continued)

	Segment Concentration _{mt}	Number of Competitors Entry _{mt}	Number of Competitors Exit _{mt}	ln (Company's age _{it})
Segment Entry _{imt}				
Segment Exit _{imt}				
Segment competition _{mt}				
Segment competition _{mt} squared				
Segment Concentration _{mt}	1.000			
Number of Competitors Entry _{mt}	-0.378	1.000		
Number of Competitors Exit _{mt}	-0.070	0.074	1.000	
ln (Company's age _{it})	-0.033	0.004	0.003	1.000
Company's size _{it}	-0.072	0.042	0.040	0.335
Product breadth _{it}	-0.051	0.013	0.006	0.908
Entry experience _{imt}	-0.142	0.042	0.051	0.369
ln (Segment sales _{mt})	-0.495	0.154	0.020	0.016
New Competitor entry _t	-0.036	-0.013	-0.016	0.019
Competitor exit _t	-0.097	0.052	0.036	0.027
ln (US Population _t)	-0.276	0.173	0.181	0.135
US GDP Growth _t	0.045	-0.063	-0.055	-0.016
US GDP Decline _t	0.012	0.017	-0.020	0.018

Table 8. Sensitivity Analysis - Correlation of all variables, 26 Segments (Continued)

	Company's size _{it}	Product breadth _{it}	Entry experience _{imt}
Company's size _{it}	1.000		
Product breadth _{it}	0.372	1.000	
Entry experience _{imt}	0.241	0.376	1.000
ln (Segment sales _{mt})	0.030	0.017	0.173
New Competitor entry _t	0.034	0.007	0.002
Competitor exit _t	0.090	0.046	0.036
ln (US Population _t)	0.310	0.169	0.127
US GDP Growth _t	-0.073	-0.010	-0.028
US GDP Decline _t	0.055	0.010	0.017

Table 8. Sensitivity Analysis - Correlation of all variables, 26 Segments (Continued)

	Biggest Segment _{mt}	Competitor exit _t	New Competitor entry _t	ln (US Population _t)
ln (Segment sales _{mt})	1.000			
New Competitor entry _t	0.046	1.000		
Competitor exit _t	0.020	0.234	1.000	
ln (US Population _t)	0.109	0.087	0.241	1.000
US GDP Growth _t	-0.005	-0.044	-0.397	-0.246
US GDP Decline _t	0.003	-0.139	-0.051	0.078

Table 8. Sensitivity Analysis - Correlation of all variables, 26 Segments (Continued)

	US GDP Growth _t	US GDP Decline _t
US GDP Growth _t	1.000	
US GDP Decline _t	-0.474	1.000

CHAPTER FOUR

Results

The effects of the independent variables on the likelihood of a firm to enter or to exit from a particular segment in a specific year were estimated using a logistic regression. Table 9 shows the estimated coefficients. Model 1 in table 3 provides a baseline model of a firm's tendency to enter a particular segment, which includes: company, segment and industry level control variables. The complete model depicted in model 2, which includes segment competition, segment concentration, and the number of competitor entries and exits variables, is an improvement over that model 1 with a pseudo R^2 of .071 (vs a pseudo R^2 of .046 for basic model). Models 3 and 4 repeat this analysis for a firm's tendency to exit from a particular segment. Model 4 again shows significant improvement over the model 3 baseline (a pseudo R^2 of .241 vs a pseudo R^2 of .159 for basic model). All models have a satisfactory fit to the data, with a chi-squared fit statistic significant at the .001 confidence level.

Table 9. The Estimated Effects

	Segment Entry		Segment Exit	
Dependent Variables	(1)	(2)	(3)	(4)
Tested Hypotheses				
Segment competition _{mt} (lagged 2 years)		0.891 ^{***} (0.122)		-1.634 ^{***} (0.133)
Segment competition _{mt} Squared (lagged 2 years)		-0.067 ^{***} (0.015)		0.136 ^{***} (0.012)
Segment concentration _{mt}		1.970 ^{***} (0.310)		-5.886 ^{***} (0.369)
Number of competitors entry _{mt}		0.602 ^{***} (0.071)		-0.906 ^{***} (0.116)
Number of competitors exit _{mt}		-0.363 ^{***} (0.090)		0.920 ^{***} (0.111)
Company Characteristics				
ln (Company's age _{it})	-0.301 ^{**} (0.109)	-0.318 ^{**} (0.114)	-0.477 ^{***} (0.115)	-0.560 ^{***} (0.120)
Company's size _{it}	-0.004 (0.011)	-0.004 (0.011)	-0.046 ^{***} (0.010)	-0.041 ^{***} (0.011)
Product breadth _{it}	0.107 ^{**} (0.035)	0.124 ^{***} (0.035)	0.237 ^{***} (0.032)	0.216 ^{***} (0.034)
Entry experience _{imt}	0.258 ^{***} (0.035)	0.307 ^{***} (0.037)	0.658 ^{***} (0.030)	0.576 ^{***} (0.034)
Segment Characteristics				
ln (Segment sales _{mt})	0.075 [*] (0.029)	-0.001 (0.037)	0.022 (0.029)	-0.111 ^{**} (0.036)

1. Standard errors in parentheses

2. ⁺⁺ $p < 0.1$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$

3. All independent variables except Segment Density are lagged by one year.

Table 9. The Estimated Effects (Continued)

Industry events and characteristics.				
New competitor entry _t	-0.090 (0.123)	0.034 (0.125)	-0.311* (0.134)	-0.356* (0.140)
Competitor exit _t	-0.144 (0.118)	0.100 (0.120)	0.149 (0.124)	0.131 (0.125)
ln (US Population _t)	0.945 (0.643)	-0.631 (0.678)	-1.063 ⁺⁺ (0.614)	-1.303* (0.654)
US GDP Growth _t	-0.042 (0.030)	-0.032 (0.032)	0.009 (0.030)	-0.021 (0.031)
US GDP Decline _t	-0.272 (0.187)	-0.157 (0.189)	0.064 (0.159)	-0.098 (0.160)
_cons	-22.022 ⁺⁺ (12.272)	6.189 (12.919)	17.093 (11.715)	29.614* (12.515)
<i>N</i>	17357	17089	17357	17089
Wald chi2(10(basic model)) (15(complete model))	327.46	440.56	1110.84	1255.77
Prob > chi2	0.0000	0.0000	0.0000	0.0000
Pseudo R ²	0.046	0.071	0.159	0.241
log pseudo-likelihood	-2066.798	- 1980.64 0	- 1975.60 3	- 1777.603

1. *Standard errors in parentheses*

2. ⁺⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3. *All independent variables except Segment Density are lagged by one year.*

The Effect of Segment Structure on Market Segment Selection

Segment competitive level and market segment selection. The competitive level in a segment exhibits the hypothesized non-monotonic effect on firm's tendency to enter and to avoid a particular segment, with a positive coefficient ($\beta = 0.891$, $z = 7.30$, $p < 0.001$) for its linear component and a negative coefficient ($\beta = -0.067$, $z = -4.58$, $p < 0.001$) for its quadratic term. Therefore, H1 is supported. Similarly, the significant negative linear ($\beta = -1.634$, $z = -12.31$, $p < 0.001$), and positive squared estimates ($\beta = 0.136$, $z = 11.66$, $p < 0.001$) of segment competition in the analysis suggest an increasing return relationship between the competitive level in a segment and a company's tendency to exit from a particular segment. Consequently, H2 is strongly supported.

Segment concentration and market segment selection. The estimated coefficients indicate that concentration in a segment has a significantly positive effect on the firm's tendency to enter a particular segment ($\beta = 1.970$, $z = 6.36$, $p < 0.001$). Therefore, H3a is strongly supported. On the other hand, segment concentration also has a significantly negative effect on the firm's tendency to exit from a particular segment ($\beta = -5.886$, $z = -15.94$, $p < 0.001$). Thus, the result strongly supports H3b.

The Effect of Competitor Behavior on Market Segment Selection

Number of Competitor Entries has a significantly positive effect on a firm's tendency to enter a particular segment ($\beta = 0.602$, $z = 8.52$, $p < 0.001$) and a significantly negative effect on a firm's tendency to exit from that particular segment ($\beta = -0.906$, $z = -7.82$, $p < 0.001$). These results strongly support H4. On the other hand, Number of Competitor Exits has a significant negative effect on a firm's tendency to enter a particular

segment ($\beta = -0.363$, $z = -4.05$, $p < 0.001$) and has a significantly positive effect on a firm's tendency to exit from a particular segment ($\beta = 0.920$, $z = 8.31$, $p < 0.001$). Thus, H5 is supported.

The Effect of Control Variables on Market Segment Selection

Several of the organizational characteristics also influence a firm's tendency to enter a particular segment or to exit from it. Supporting previous findings, we found that a firm's tendency to enter a particular segment or to exit from it is decreased as firms grow older, suggesting that rigidity is increasing with a firm's age ($\beta = -0.318$, $z = -2.79$, $p < 0.01$ for a firm's tendency to enter a segment, and $\beta = -0.560$, $z = -4.67$, $p < 0.001$ for a firm's tendency to exit from a segment). Old organizations are less likely to change than young ones (e.g. Thornhill and Amit 2003; Baum and Korn 1996; Hannan and Freeman 1984). We also found that large firms are less likely to exit from a segment than small ones ($\beta = -0.041$, $z = -3.86$, $p < 0.001$). This result supports previous findings suggesting that large firms are better able to absorb the cost and to spread the risk associated with a segment (e.g., Mowery and Rosenberg 1998; Teitelman 1994), so they are more able to maintain their investment in the segments. We also found that experienced firms are more active in adding new positions, exiting the current positions or in repositioning their products than their less experienced competitors ($\beta = 0.307$, $z = 8.24$, $p < 0.001$ for firm's tendency to enter a segment, and $\beta = 0.576$, $z = 16.90$, $p < 0.001$ for firm's tendency to exit from a segment). This result supports previous findings (e.g. Masso, Rõigas, and Priit 2014). Still related to a firm's experience in the segment entry – exit activities, we also found that generalist firms show a higher tendency to enter or to exit a segment ($\beta = 0.124$, $z = 3.52$, $p < 0.001$ for firm's tendency to enter a segment, and $\beta = 0.216$, $z = 6.35$, $p < 0.001$ for

firm's tendency to exit from a segment). Finally, we found that the higher the sales produced by a segment, the more reluctant the firms located in that position will be to leave that segment ($\beta = -0.111$, $z = -3.11$, $p < 0.01$).

The Robustness check on Market Segment Selection Model

Some segments contain only one company, or some companies create products with unique characteristics. To check the robustness of our analysis, we create another data set that excludes the segments containing only one company. We performed the robustness analysis by testing the effects of the independent variables that were included in the previous model (i.e. segment competition, segment concentration, and the number of competitor entries and exits, and its control variables) on the likelihood of a firm to enter or to exit from a particular segment in a specific year by using a logistic regression. Table 10 provides the estimated coefficients. Deleting some outliers does not improve the goodness of fit of either the entry model or the segment exit model. These robustness test models provide a pseudo R^2 of 0.070 for the segment entry model and a pseudo R^2 of 0.238 for the segment exit model and still have a satisfactory fit to the data, with a chi-squared fit statistic significant at the .001 confidence level.

Table 10. Robustness Analysis – The Estimated Effects

Dependent Variables	Segment Entry	Segment Exit
Tested Hypotheses		
Segment competition _{mt} (lagged 2 years)	0.878*** (0.120)	-1.613*** (0.133)
Segment competition _{mt} Squared (lagged 2 years)	-0.064*** (0.014)	0.133*** (0.012)
Segment concentration _{mt}	2.068*** (0.307)	-5.802*** (0.380)
Number of competitors entry _{mt}	0.607*** (0.071)	-0.892*** (0.115)
Number of competitors exit _{mt}	-0.388*** (0.091)	0.916*** (0.111)
Company Characteristics		
ln (Company's age _{it})	-0.327** (0.114)	-0.556*** (0.121)
Company's size _{it}	-0.004 (0.011)	-0.040*** (0.011)
Product breadth _{it}	0.125*** (0.035)	0.210*** (0.034)
Entry experience _{imt}	0.302*** (0.038)	0.577*** (0.035)
Segment Characteristics		
ln (Segment sales _{mt})	-0.009 (0.037)	-0.087* (0.035)

1. *Standard errors in parentheses*
2. $^{++} p < 0.1$, $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$
3. *All independent variables except Segment Density are lagged by one year.*

Table 10. Robustness Analysis – The Estimated Effects (Continued)

Industry events and characteristics.		
New competitor entry _t	0.043 (0.125)	-0.350* (0.141)
Competitor exit _t	0.101 (0.121)	0.121 (0.126)
ln (US Population _t)	-0.595 (0.679)	-1.017 (0.663)
US GDP Growth _t	-0.035 (0.032)	-0.019 (0.031)
US GDP Decline _t	-0.166 (0.191)	-0.085 (0.160)
_cons	5.628 (12.946)	23.760 ⁺⁺ (12.687)
<i>N</i>	16491	16491
Wald chi2 (15)	426.95	1208.11
Prob > chi2	0.0000	0.0000
Pseudo R ²	0.070	0.238
log pseudo-likelihood	-1963.654	-1747.155

1. *Standard errors in parentheses*
2. ⁺⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
3. *All independent variables except Segment Density are lagged by one year.*

Robustness Test: The Effect of Segment Structure on Market Segment Selection

Robustness Test: Segment competitive level and market segment selection.

After dropping the outliers, the independent variables in this data set provides similar effects. The competitive level in a segment also exhibits the hypothesized non-monotonic effect on firm's tendency to enter and to avoid a particular segment, with a positive coefficient ($\beta = 0.878$, $z = 7.32$, $p < 0.001$) for its linear component and a negative coefficient ($\beta = -0.064$, $z = -4.46$, $p < 0.001$) for its quadratic term. Therefore, H1 is also supported in this data set. Similarly, the significant negative linear ($\beta = -1.613$, $z = -12.16$, $p < 0.001$), and positive squared estimates ($\beta = 0.133$, $z = 11.38$, $p < 0.001$) of segment competition in the analysis also suggest an increasing return relationship between the competitive level in a segment and a company's tendency to exit from a particular segment. Consequently, H2 is also strongly supported in this data set.

Robustness Test: Segment concentration and market segment selection.

The estimated coefficients indicate that concentration in a segment has also a significantly positive effect on the firm's tendency to enter a particular segment ($\beta = 2.068$, $z = 6.73$, $p < 0.001$). Therefore, H3a is also strongly supported in this data set. On the other hand, segment concentration also has a significantly negative effect on the firm's tendency to exit from a particular segment ($\beta = -5.802$, $z = -15.27$, $p < 0.001$). Thus, the result also strongly supports H3b in this data set.

Robustness Test: The Effect of Competitor Behavior on Market Segment Selection

In this data set, the number of competitor entries also has a significantly positive effect on a firm's tendency to enter a particular segment ($\beta = 0.607$, $z = 8.58$, $p < 0.001$)

and a significantly negative effect on a firm's tendency to exit from that particular segment ($\beta = -0.892$, $z = -7.75$, $p < 0.001$). These results also strongly support H4. The number of competitor exits also has a significant negative effect on a firm's tendency to enter a particular segment ($\beta = -0.388$, $z = -4.29$, $p < 0.001$) and has a significantly positive effect on a firm's tendency to exit from a particular segment ($\beta = 0.916$, $z = 8.29$, $p < 0.001$). Thus, H5 is also supported.

Robustness Test: The Effect of Control Variables on Market Segment Selection

In this data set, we found that the control variables also have similar effects. A firm's tendency to enter a particular segment or to exit from it is also decreased as firms grow older ($\beta = -0.327$, $z = -2.88$, $p < 0.01$ for firm's tendency to enter a segment, and $\beta = -0.556$, $z = -4.61$, $p < 0.001$ for firm's tendency to exit from a segment). We also found that large firms are less likely to exit from a segment than small ones ($\beta = -0.040$, $z = -3.80$, $p < 0.001$). Experienced firms are still more active in adding new positions, exiting the current positions or in repositioning their products than their less experienced competitors ($\beta = 0.302$, $z = 8.06$, $p < 0.001$ for firm's tendency to enter a segment, and $\beta = 0.577$, $z = 16.63$, $p < 0.001$ for firm's tendency to exit from a segment). We also found that the generalist firms still show a higher tendency to enter or to exit a segment with beta ($\beta = 0.125$, $z = 3.53$, $p < 0.001$ for firm's tendency to enter a segment, and beta ($\beta = 0.210$, $z = 6.15$, $p < 0.001$ for firm's tendency to exit from a segment). Finally, we also found that the bigger the sales produced by a segment, the more reluctant the firms located in that position to leave that segment ($\beta = -0.087$, $z = -2.50$, $p < 0.05$).

The Sensitivity analysis on Market Segment Selection Model

We also performed sensitivity analyses to test if the products in the market are more similar to each other, or if there are fewer segments in the market, or if the segments are bigger than we thought. The data sets used for these sensitivity analyses contain fewer observations since our model used the firm–segment pair combination as our unit analysis. The fewer the segments in the market, the fewer our observations would be. To conduct these sensitivity analyses, two more data sets were created. The first one clustered the products into 38 groups, while the second one grouped the products into 26 segments. Thirty-eight segments and twenty-six segments were chosen since they provide the decent combination of Duda and Hart (2001) index values. A large $Je(2)/Je(1)$ index value and a small pseudo T-squared value indicate distinct clustering. In these sensitivity analyses, we performed the analyses by testing the effects of the independent variables that were included in the previous models (i.e. segment competition, segment concentration, the number of competitor entries and exits, and their control variables) on the likelihood of a firm to enter or to exit from a particular segment in a specific year by using a logistic regression. The estimated coefficients for data set containing 38 segments are listed in table 11, while the estimated coefficients for data set containing 26 segments are listed in table 12. Having fewer segments does not improve the goodness of fit of either the segment entry model or the segment exit model. The thirty-eight segments models provide a pseudo R^2 of 0.067 for the segment entry model and a pseudo R^2 of 0.220 for the segment exit model, while the twenty-six segments models provide a pseudo R^2 of 0.052 for the segment entry model and a pseudo R^2 of 0.189 for the segment exit model. All models for sensitivity

analyses have a satisfactory fit to the data, with a chi-squared fit statistic significance at the .001 confidence level.

Table 11. Sensitivity Analysis (38 Segments) – The Estimated Effects

Dependent Variables	Segment Entry	Segment Exit
Tested Hypotheses		
Segment competition _{mt} (lagged 2 years)	0.699*** (0.120)	-1.026*** (0.130)
Segment competition _{mt} Squared (lagged 2 years)	-0.043*** (0.013)	0.089*** (0.011)
Segment concentration _{mt}	1.702*** (0.312)	-5.065*** (0.459)
Number of competitors entry _{mt}	0.413*** (0.062)	-0.494*** (0.114)
Number of competitors exit _{mt}	-0.280** (0.088)	0.583*** (0.108)
Company Characteristics		
ln (Company's age _{it})	-0.340** (0.123)	-0.459*** (0.134)
Company's size _{it}	-0.008 (0.011)	-0.044*** (0.011)
Product breadth _{it}	0.099** (0.037)	0.206*** (0.038)
Entry experience _{imt}	0.375*** (0.035)	0.602*** (0.033)
Segment Characteristics		
ln (Segment sales _{mt})	-0.033 (0.038)	-0.145*** (0.038)

1. *Standard errors in parentheses*
2. $^{++} p < 0.1$, $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$
3. *All independent variables except Segment Density are lagged by one year.*

Table 11. Sensitivity Analysis (38 Segments) – The Estimated Effects (Continued)

Industry events and characteristics.		
New competitor entry _t	-0.111 (0.143)	-0.274 ⁺⁺ (0.156)
Competitor exit _t	-0.043 (0.134)	0.041 (0.143)
ln (US Population _t)	0.238 (0.749)	-1.730 [*] (0.735)
US GDP Growth _t	-0.041 (0.033)	0.009 (0.033)
US GDP Decline _t	-0.083 (0.185)	-0.104 (0.196)
_cons	-9.332 (14.235)	36.268 [*] (14.104)
<i>N</i>	12407	12407
Wald chi2 (15)	350.61	965.75
Prob > chi2	0.0000	0.0000
Pseudo R ²	0.067	0.220
log pseudo-likelihood	-1594.841	-1433.193

1. *Standard errors in parentheses*
2. ⁺⁺ $p < 0.1$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$
3. *All independent variables except Segment Density are lagged by one year.*

Sensitivity Analysis – 38 Segments: The Effect of Segment Structure on Market Segment Selection

Sensitivity Analysis – 38 Segments: Segment competitive level and market segment selection. By grouping the companies' products into fewer segment (38 segments), the independent variables in this data set still provide similar effects. The competitive level in a segment also exhibits the hypothesized non-monotonic effect on firm's tendency to enter and to avoid a particular segment, with a positive coefficient ($\beta = 0.699$, $z = 5.82$, $p < 0.001$) for its linear component and a negative coefficient ($\beta = -0.043$, $z = -3.43$, $p < 0.001$) for its quadratic term. Therefore, H1 is also supported in this data set. Similarly, the significant negative linear ($\beta = -1.026$, $z = -7.91$, $p < 0.001$), and positive squared estimates ($\beta = 0.089$, $z = 8.17$, $p < 0.001$) of segment competition in the analysis also suggest an increasing return relationship between the competitive level in a segment and a company's tendency to exit from a particular segment. Consequently, H2 is also strongly supported.

Sensitivity Analysis – 38 Segments: Segment concentration and market segment selection. The estimated coefficients indicate that concentration in a segment still has a significantly positive effect on the firm's tendency to enter a particular segment ($\beta = 1.702$, $z = 5.46$, $p < 0.001$). Therefore, H3a is still strongly supported. On the other hand, segment concentration also has a significantly negative effect on the firm's tendency to exit from a particular segment ($\beta = -5.065$, $z = -11.03$, $p < 0.001$). Thus, the result also strongly supports H3b.

Sensitivity Analysis – 38 Segments: The Effect of Competitor Behavior on Market Segment Selection

In this data set, the number of competitor entries also has a significantly positive effect on a firm's tendency to enter a particular segment ($\beta = 0.413$, $z = 6.67$, $p < 0.001$) and a significantly negative effect on a firm's tendency to exit from that particular segment ($\beta = -0.494$, $z = -4.35$, $p < 0.001$). These results still strongly support H4. The number of competitor exits also has a significant negative effect on a firm's tendency to enter a particular segment ($\beta = -0.280$, $z = -3.18$, $p < 0.01$) and has a significantly positive effect on a firm's tendency to exit from a particular segment ($\beta = 0.583$, $z = 5.40$, $p < 0.001$). Thus, H5 is also supported in this data set.

Sensitivity Analysis – 38 Segments: The Effect of Control Variables on Market Segment Selection

In this data set, we found that the control variables also have similar effects. A firm's tendency to enter a particular segment or to exit from it is also decreased as firms grow older ($\beta = -0.340$, $z = -2.76$, $p < 0.01$ for firm's tendency to enter a segment, and $\beta = -0.459$, $z = -3.43$, $p < 0.001$ for firm's tendency to exit from a segment). We also found that large firms are less likely to exit from a segment than small ones ($\beta = -0.044$, $z = -3.97$, $p < 0.001$). Experienced firms are still more active in adding new positions, exiting the current positions or in repositioning their products than their less experienced competitors ($\beta = 0.375$, $z = 10.88$, $p < 0.001$ for firm's tendency to enter a segment, and $\beta = 0.602$, $z = 18.06$, $p < 0.001$ for firm's tendency to exit from a segment). We also found that the generalist firms still show a higher tendency to enter or to exit a segment with beta (β) = 0.099, $z = 2.69$, $p < 0.01$ for firm's tendency to enter a segment, and beta (β) = 0.206, $z =$

5.38, $p < 0.001$ for firm's tendency to exit from a segment. Finally, we also found that the bigger the sales produced by a segment, the more reluctant the firms located in that position will be to leave that segment ($\beta = -0.145$, $z = -3.83$, $p < 0.001$).

Table 12. Sensitivity Analysis (26 Segments) – The Estimated Effects

Dependent Variables	Segment Entry	Segment Exit
Tested Hypotheses		
Segment competition _{mt} (lagged 2 years)	0.826*** (0.138)	-0.858*** (0.161)
Segment competition _{mt} Squared (lagged 2 years)	-0.061*** (0.013)	0.066*** (0.012)
Segment concentration _{mt}	2.033*** (0.339)	-4.731*** (0.608)
Number of competitors entry _{mt}	0.473*** (0.087)	-0.525*** (0.131)
Number of competitors exit _{mt}	-0.165 (0.106)	0.711*** (0.143)
Company Characteristics		
ln (Company's age _{it})	-0.289* (0.137)	-0.527*** (0.157)
Company's size _{it}	-0.002 (0.011)	-0.044*** (0.011)
Product breadth _{it}	0.089 ⁺⁺ (0.051)	0.267*** (0.049)
Entry experience _{imt}	0.330*** (0.048)	0.615*** (0.042)
Segment Characteristics		
ln (Segment sales _{mt})	-0.083 ⁺⁺ (0.042)	-0.183*** (0.043)

1. *Standard errors in parentheses*
2. ⁺⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
3. *All independent variables except Segment Density are lagged by one year.*

Table 12. Sensitivity Analysis (26 Segments) – The Estimated Effects (Continued)

Industry events and characteristics.		
New competitor entry _t	0.356* (0.152)	-0.202 (0.182)
Competitor exit _t	0.062 (0.157)	0.274 ⁺⁺ (0.166)
ln (US Population _t)	0.624 (0.890)	-1.350 ⁺⁺ (0.810)
US GDP Growth _t	-0.016 (0.040)	0.058 (0.041)
US GDP Decline _t	-0.025 (0.220)	0.186 (0.210)
_cons	-16.919 (16.915)	28.666 ⁺⁺ (15.521)
<i>N</i>	9137	9137
Wald chi2 (15)	197.08	650.65
Prob > chi2	0.0000	0.0000
Pseudo R ²	0.052	0.189
log pseudo-likelihood	-1189.843	-1034.348

1. *Standard errors in parentheses*
2. ⁺⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
3. *All independent variables except Segment Density are lagged by one year.*

Sensitivity Analysis – 26 Segments: The Effect of Segment Structure on Market Segment Selection

Sensitivity Analysis – 26 Segments: Segment competitive level and market segment selection. By grouping the companies' products into even fewer segment (26 segments) and assuming the segments are larger than we thought, the independent variables in this data set still provide similar effects as well. The competitive level in a segment still exhibits the hypothesized non-monotonic effect on firm's tendency to enter and to avoid a particular segment, with a positive coefficient ($\beta = 0.826$, $z = 6.00$, $p < 0.001$) for its linear component and a negative coefficient ($\beta = -0.061$, $z = -4.52$, $p < 0.001$) for its quadratic term. Therefore, H1 is also supported in this data set. Similarly, the significant negative linear ($\beta = -0.858$, $z = -5.34$, $p < 0.001$), and positive squared estimates ($\beta = 0.066$, $z = 5.67$, $p < 0.001$) of segment competition in the analysis also suggest an increasing return relationship between the competitive level in a segment and a company's tendency to exit from a particular segment. Consequently, H2 is also strongly supported in this data set.

Sensitivity Analysis – 26 Segments: Segment concentration and market segment selection. The estimated coefficients indicate that concentration in a segment has also a significantly positive effect on the firm's tendency to enter a particular segment ($\beta = 2.033$, $z = 6.00$, $p < 0.001$). Therefore, H3a is also strongly supported. On the other hand, segment concentration also has a significantly negative effect on the firm's tendency to exit from a particular segment ($\beta = -4.731$, $z = -7.79$, $p < 0.001$). Thus, the result also strongly supports H3b.

Sensitivity Analysis – 26 Segments: The Effect of Competitor Behavior on Market Segment Selection

In this data set, the number of competitor entries also has a significantly positive effect on a firm's tendency to enter a particular segment ($\beta = 0.473$, $z = 5.46$, $p < 0.001$) and a significantly negative effect on a firm's tendency to exit from that particular segment ($\beta = -0.525$, $z = -4.02$, $p < 0.001$). These results still strongly support H4. The number of competitor exits still has a negative effect on a firm's tendency to enter a particular segment ($\beta = -0.165$, $z = -1.55$, $p = 0.120$), however, the effect is not significant in this data set. The number of competitor exits has a significantly positive effect on a firm's tendency to exit from a particular segment ($\beta = 0.711$, $z = 4.98$, $p < 0.001$). Thus, hypothesis 5 is partially supported in this data set.

Sensitivity Analysis – 26 Segments: The Effect of Control Variables on Market Segment Selection

In this data set, we found that the control variables also have similar effects. A firm's tendency to enter a particular segment or to exit from it is also decreased as firms grow older ($\beta = -0.289$, $z = -2.12$, $p < 0.05$ for firm's tendency to enter a segment, and $\beta = -0.527$, $z = -3.36$, $p < 0.001$ for firm's tendency to exit from a segment). We also found that large firms are less likely to exit from a segment than small ones ($\beta = -0.044$, $z = -3.81$, $p < 0.001$). Experienced firms are still more active in adding new positions, exiting the current positions or in repositioning their products than their less experienced competitors ($\beta = 0.330$, $z = 6.81$, $p < 0.001$ for firm's tendency to enter a segment, and $\beta = 0.615$, $z = 14.53$, $p < 0.001$ for firm's tendency to exit from a segment). We also found that the generalist firms still show a higher tendency to enter or to exit a segment with beta (β) =

0.089, $z = 1.75$, $p < 0.1$ for firm's tendency to enter a segment, and $\beta = 0.267$, $z = 5.44$, $p < 0.001$ for firm's tendency to exit from a segment. However, its significance in the segment entry model becomes marginal in this data set. Finally, we still found that the bigger the sales produced by a segment, the more reluctant the firms located in that position will be to leave that segment ($\beta = -0.183$, $z = -4.30$, $p < 0.001$).

CHAPTER FIVE

Discussion

The purpose of this study is to investigate the dynamics of the position selection made by firms, in which segments a firm decides to enter and compete, and in which segments a firm decides to exit from the competitive perspective. The studies that connect product changes to product positioning movement are scant and empirical analyses of positioning decisions in the academic literature have also remained scarce, especially the ones that investigate competitive driven positioning. The effect of segment structure, namely segment competitive level and segment concentration, as well as the effect of competitors' movement on a firm's position selection are investigated in the context of the automotive industry in the USA on a longitudinal basis.

A key contribution made by this research is that we simultaneously account for the seemingly contradictory effects predicted by segment competitive condition and by learning/imitation behavior in addition to investigating the link between them. We found that both segment condition and competitors' behavior determine a firm's choices about which new segments to enter and which current segments to exit, shaping the patterns of the firm's product positioning movement in the market.

Competitive level in a segment positively influences segment entry and negatively influences segment exit when the competitive level is low. This suggests that a firm tends to select and to stay in a segment with a low competitive level. However, its squared estimates indicate an opposite sign, suggesting that a firm tends to avoid and to leave a segment with a higher level of competition. This supports the idea that segment competitive conditions form an important managerial consideration in segment selection, both for the

decision to enter and to exit a segment (e.g. Porter 1980, Dobrev and Kim 2006, Baum and Shipilov 2006). Managers dislike competition and strive to keep the competitive pressure low by moving and placing their product portfolio in segments with a low level of competition, in segments without many competitors and leaving segments with many competitors, or with a high level of competition.

On the other hand, segment concentration positively influences a firm's tendency to enter a segment and negatively influences its tendency to exit from a particular segment. This finding is in line with the previous findings, indicating that segments with higher concentration are more attractive (e.g. Porter 1980; Jacobsen 1988; Aboulnasr et al. 2008), and thus are regarded as more favorable and more likely to be considered by managers, either to be entered or to be defended. It has been shown that given the population level in the U.S. automotive industry, high concentration attracts competitor's entries.

In line with the expectations of the behavioral perspective, the number of competitor entries in a particular segment positively influences a firm's tendency to enter that particular segment and negatively influences that firm's tendency to exit from that particular segment. On the other hand, the number of competitor exits from a particular segment negatively influences a firm's tendency to enter that particular segment and positively influences the firm's tendency to exit from that particular segment. These results support the findings suggesting that the beliefs and actions of managers are affected by the actions of others (e.g. Bikhchandani, Hirshleifer, and Welch 1998). According to the previous research conducted (e.g. Semadeni and Anderson 2010, Abrahamson 1991), managers are afraid that they might miss a significant market opportunity or competitors could gain a competitive advantage if they do not follow the signal given by their

competitors. However, these managers' efforts not to miss the market opportunity that is sometimes based on speculation about what their competitors know or believe about the market (e.g. Semadeni and Anderson 2010, Abrahamson 1991) by imitating them may impede managerial efforts to keep the competitive pressure low. The position movement of competitors may give a signal or competitive pressure that contradicts the signal made by segment concentration and segment competitive level, and this may well be the reason why some research found that certain niche changes fail to reduce the competition experienced by an organization. The results from this research suggest that the more competitors enter or exit a segment at a given time, the greater the perceived economic cost (possible rewards or potential cost) of not following it, thus the more likely it becomes that this action will be followed by managers. When many competitors create products with similar characteristics, this would send a strong signal about segment potential to a manager. Therefore, regardless of whether the potential is real or not, it compels the manager to follow the competitors by creating the firm's own version that has similar characteristics to the competitors' offerings. Additionally, the number of entries into a particular segment provides a stronger effect for the firms outside the segment to enter that particular segment than the effect provided by the number of exits, while the number of exits from a particular segment provides a stronger incentive for the incumbents in that segment than the effect provided by the number of entries.

This study also contributes to the literature by examining segment selection from a longitudinal perspective. The majority of previous studies related to segment selection have relied on cross-sectional data (Dobrev and Kim 2006). Since this study spans a broad time frame from 1950 to 1993, longitudinal effects have been delineated, providing a

meaningful understanding of the segment selection. Moreover, since this study includes all car types in the North American market, it provides a more rigorous test of the assumptions of segment selection than have been presented previously. These study characteristics allow for a more rigorous test of the contribution segment structure as well as competitor movement to segment selection decisions in the U.S. market. Finally, our approach that emphasizes discrete distinction between segments provides a more realistic approach than the usual position measures used in prior analyses of the auto industry, in which market positions captured by the distance, assuming a meaningful difference in the positions of all firms located within a segment, except when the positions of firms are identical (e.g. Dobrev, Kim and Hannan 2001, Dobrev, Kim, and Carroll 2003).

From a managerial perspective, the insight from this research would help managers to better understand the complex competitive environment as well as to better predict competitors' competitive moves and responses in the market space. The more the managers understand the market, the more realistic their prediction will be, and the less risk a company should bear. In addition, with an increased understanding of segment selection behavior, firms can better understand their own decision-making process in segment selection, better manage their product portfolio and positions as well as making better decisions in designing and developing new products, especially in deciding what product characteristics should be developed, changed and dropped. We also reconfirm that older and bigger competitors that have more resources are less likely to leave their current segments. The findings of this study provide important guidelines for formulating strategies and estimating competitive actions, especially when a company creates a new position, abandons the current one(s) or modifies and changes the position of its products.

Theoretical Contributions

The position move between market segments is a specific instance of organizational change. Studies of organizational change and adaptation fall into two categories: Those that investigate its outcomes and those that model its likelihood of occurrence (Barnett and Carroll 1995; Singh 2006). Our research concerns the latter. Although we have learned a great deal about the interplay of adaptation and selection processes implicated in the outcomes of organizational transformation (Singh, House, and Tucker 1986; Barnett and Freeman 2001), less effort has been spent developing theories predicting transformation. The reason for this imbalance may be that in most studies, organizations are seen as being propelled to change either by exogenous processes unrelated to organizational dynamics (such as change in consumer demand), emergence of new technologies and institutional and regulatory changes (Delacroix and Solt 1988; Singh, Tucker and Meinhard 1991; Dobbin et al. 1993; Romanelli and Tushman 1994; Sutton et al. 1994; Minkoff 1999) or by various organizational features such as scope, size, age, prior history of change or political affiliation (Delacroix and Swaminathan 1991; Amburgey, Kelly and Barnett 1993; Halliday, Powell and Granfors 1993; Haveman 1993b; Dobrev 1999; Sorenson 2003; Dobrev, Kim and Carroll 2003). These theories are paramount to understanding the intra-organizational implications of change, but they are less helpful for understanding how individual change attempts by firms have an impact on shift in the environment of other organizations (Hannan and Freeman 1989).

In this research, we make the following main contributions: First we add to the important but under-researched area of positioning movement by directly investigating individual organizational change (i.e. product modifications, new products, or product

termination) that results in new segment entries or segment exits. The main contribution of our research lies in the attempt to address the matter of how a firm's individual market position movements affect inter-firm rivalry. In this research, we examine a detailed rivalry behavior as firms enter and leave the market segment. We are concerned not just with how a firm chooses a position in the landscape of competitors, but also how the landscape changes as the competitors, in turn, respond to the firm's move. We investigate this competitive interaction from the angle of product similarity (i.e. segment), where firms contact and compete with each other through similarity of their products. Moreover, we simultaneously account for and elaborate on the seemingly contradictory effects of competitive strategy predicted by segment competitive conditions and by learning/imitation behavior to predict a firm's rivalry behavior: selecting its competitors, as well as establishing and disengaging from competition with its competitors that form the patterns of inter-organizational dynamics. In addition, the effect of firm's characteristics (i.e. firm's age, size, and number of segments) as well as the industry's characteristics (i.e. GDP growth, GDP decline, US population, the establishment of a new competitor, as well as the event when a competitor leaves the car industry) are accounted for in the model. These concerns are not new to strategy, as they have previously been addressed in work such as research into competitive groups. We keep revisiting them because these concerns are important and difficult to study. Additionally, understanding position movement between segments is also potentially important to understand how the product's identity and firm's collective identities are formed, shifted, or broken.

Second, a novel approach to modeling population dynamics by focusing on segment heterogeneity that enables us to study market position movement is created. This

model enables us to see through the dynamics of variations, selections and retention of firm's positions. Third, deriving from the extant theoretical frameworks, testable predictions regarding the effect of segment structure and competitors' behavior as well as firms' and industry's characteristics on product positioning dynamics are formulated. Fourth, we provide an empirical application using data from automotive industry. We find that both segment structure such as segment competitive level and segment concentration, and competitor behavior influence a firm's segment selection.

Fifth, this study also contributes to the literature by examining segment selection from a longitudinal perspective. The majority of previous studies related to segment selection have relied on cross-sectional data (Dobrev and Kim 2006). Since this study spans a broad time frame from 1950 to 1993, longitudinal effects have been delineated, providing a meaningful understanding of the segment selection. Moreover, since this study includes all car types on the North American market, it provides a more rigorous test of the assumptions of segment selection than have been presented previously. These study characteristics allow for a more rigorous test of the contribution of segment structure as well as competitor movement to segment selection decisions on the U.S. market. Finally, our approach that emphasizes discrete distinction between segments provides a more realistic approach than the usual position measures used in prior analyses of the auto industry, in which market positions are captured by the distance, assuming a meaningful difference in the positions of all firms located within a segment, except when the positions of firms are identical (e.g. Dobrev, Kim and Hannan 2001, Dobrev, Kim, and Carroll 2003).

Managerial Implications

This study has significant managerial implications. Thinking strategically is a foundation of modern business and competitive strategy, yet is increasingly difficult in a dynamic environment. Day and Reibstein (1997) identify two strategic errors companies often fall prey to in the face of a dynamic business setting: the failure to anticipate competitors' moves and the failure to recognize potential interactions over time. We characterize the first failure as managerial failure to anticipate competitors' likely actions, and the second as managerial failure to anticipate competitors' likely reactions to their own moves. A strong conceptual case has also been developed suggesting decision makers often do not effectively conjecture about their competitors' future behavior, particularly their rivals' reactions to their own decisions (Zajac and Bazerman 1991, Deshpande and Gatignon 1994, Hutchinson and Meyer 1994, Moore and Urbany 1994, Reibstein and Chussil 1997, Urbany and Montgomery 1998).

Managers considering a new product launch or product pruning ponder whether to enter a segment that has been well established, or to lower the competitive pressure by creating products with uncommon characteristics (i.e. entering a segment that only has few competitors) or by quitting a highly competitive position, or to follow their competitors movement in order not to miss out on market opportunities by creating a product that has similar characteristics to products launched by its competitors. This consideration is complicated further since the managers should also consider the complex competitive environment as well as competitors' responses and movements that are hard to predict and affect the firm's profit. Additionally, a decision to enter into a particular position or to exit from it, both have deep consequences for the firm's investment.

Therefore, the ability to make realistic predictions becomes important since knowing capability of the firm and/or its competitor without the knowledge of how competitors respond can trigger a costly competitive battle. Specifically, we want to predict where the competitors will enter and exit and when, as well as how a company's action may provoke retaliation or attract imitation (how firms interact to each other). It has been found that practicing managers consider a firm's current competitive environment, the competitors' past and current competitor behavior as input in deciding their own competitive action (e.g. Montgomery, Moore, and Urbany 2005). Although the reality of competition among firms is complex, its implications for strategy and profit are great.

This study helps managers by identifying when and in what condition imitation would occur and when market structure plays a more prominent role. This proposed model and the empirical analysis would help managers to better understand the complex competitive environment, to predict more realistically competitors' competitive moves and responses in the market space, for example to predict whether the competitors will follow the entry by creating similar product or not. Consequently, this also enables them to better manage the firm's investment and the cost related to segment entry as well as segment exit. This research not only identifies when and where entry into or exit from a particular position/segment occurs, but also how firm characteristics (i.e. age, size, generalist /specialist), segment structure, and competitors' movement influence a firm's position entry and exit decisions.

The more the managers understand the market, the more realistic their prediction will be, and the less risk a company should bear. This research may help managers to make better decisions in managing product portfolio, market positions (segment portfolio) as

well as in designing and developing new products, especially in deciding what product's characteristics should be developed, changed and dropped. The findings of this study provide important guidelines for formulating strategies and estimating competitive actions, especially when a company creates a new position, abandons the current one(s) or modifies and changes the position of its products.

Implications for Policy Makers

This research would also be helpful for policy makers. The proposed model and the empirical analysis would help policy makers better understand how industries are formed, shifted, and weakened since market positioning (segment entry and exit) affect the relative competition, abundance and diversity of product in the market population. This research would especially help policy makers in their effort in establishing a healthy competition, developing industries and attracting companies to create a specific product or to enter a specific segment, geographic area or specific industry.

CHAPTER SIX

Limitation and Future Research Directions

Although this study contributes to the literature in several ways, it is also limited in other ways. First, it is performed in a single industry and only on the U.S. market, which may hinder the generalization of the results to other industries or markets. However, focusing on a single industry and market enables a more refined analysis by overcoming the detailed data requirements for an adequate test of the research hypotheses. However, further research can elucidate the role of segment structure and competitors' behavior in segment selection in alternative industry settings such as the service industry or in alternative market settings, such as the international market.

Future research should also incorporate additional environmental and firm level factors and should consider a more granular perspective of the effects of competition on segment selection. For example, Usley et al. (2010) provided empirical evidence that firms are most profitable when they are either a generalist or a specialist. However, firm positions and its orientation are dynamic. Some firms grow from specialist to generalist, and some generalists enter a specialists segment. On the other hand, those in the middle try to increase their profit by either inventing a new product with uncommon characteristics and making an entry to a specialists' market or creating a product with common characteristics and entering a generalists' market. We believe that the inclusion of these variables would further increase the predictive power of the model. Additionally, we could include the effect of product share in the market, brand share, and company share as well as the company's profit fluctuation and see their influence on a firm's tendency to enter and to exit a segment.

Finally, we also suggest including measures of performance to see the effect of imitation and segment structure as well as their frequency of occurrence on a firm's performance (e.g. product survivability, firm's innovation) in future studies. Additionally, we could investigate the effect of product and brand share as well as the effect of product launch with uncommon characteristics and product launch with common characteristics on a firm's performance.

References

- Aboulnasr, Khaled, Om Narasimhan, Edward Blair, and Rajesh Chandy. (2008). Competitive Response to Radical Product Innovations. *Journal of Marketing*, 72, 94-110.
- Abrahamson, Eric. (1991). Managerial fads and fashions: The diffusion and rejection of innovations, *Academy of Management Review*, 16(3), 586-612.
- Alcacer, Juan., Cristian L. Dezso, and Minyuan Zhao. (2013). Firm Rivalry, Knowledge Accumulation, and MNE Location Choices, *Journal of International Business*, 44(5), 504 - 520
- Amburgey, Terry L., Dawn Kelly, and William P. Barnett, (1993). Resetting the clock: The Dynamics of organizational change and failure, *Administrative Science Quarterly*, 38, 51-73
- Anderson, Lisa, and Charles A. Holt. (1997). Information Cascades in the Laboratory, *American Economic Review*, 87, 847-62
- Arthur Andersen, C. (1985). *Cars and Competition: Manufacturing Strategies*. Chicago, IL: Arthur Andersen & Co.
- Auto Editors of Consumer Guide (5 September 2007). 1956-1957 Rambler, (Accessed June 03, 2015). [available at <http://auto.howstuffworks.com/1956-1957-rambler.htm#>].
- Barnett, William P. (1990). The organizational ecology of a technological system, *Administrative Science Quarterly*, 35, pp. 31-60.
- Barnett, William P. and Glenn R. Carroll. (1995). Modeling internal organizational change, *Annual Review of Sociology*, 21, 217-236
- Barnett, William P. and John Freeman. (2001). Too much of a good thing? Product proliferation and organizational failure, *Organization Science*, 12, 539-558
- Baum, J. A. C. and Amburgey, T.L. (2002). Organizational Ecology, In Joel A. C. Baum (ed.), *Companion to Organizations*, Oxford, UK: Blackwell
- Baum, Joel A. C. and Helaine J. Korn. (1996). Competitive Dynamics of Interfirm Rivalry, *Academy of Management Journal*, 39(2), 255 – 91.
- Baum, Joel A. C. and Andrew V. Shipilov. (2006). Ecological approaches to organizations, In S.R. Clegg, C.H.T. Lawrence and W. Nord (eds.), *Handbook of Organizations Studies* (2nd ed), London: Sage Publications.
- Baum, Joel A. C. and Jitendra V. Singh. (1996). Dynamics of organizational Responses to competition, *Social Forces*, 74, 1261-1297

- Bikhchandani, Sushil, David Hirshleifer and Ivo Welch. (1992). A theory of fads, fashion, custom, and cultural Change as informational cascades', *Journal of Political Economy*, 100(5), 992-1026.
- Bikhchandani, Sushil, David Hirshleifer and Ivo Welch. (1998). Learning from the behavior of others: Conformity, fads, and informational cascades. *Journal of Economic Perspectives*, 12(3), 151–170
- Burt, R. S. (1987). Social contagion and innovation: Cohesion versus structural equivalence, *American Journal of Sociology*, 92, pp. 1287-1335.
- Carroll, Glenn R., Stanislav D. Dobrev, and Anand Swaminathan. (2002). Organizational processes of resource partitioning, *Research in Organizational Behavior*, 24, 1-40
- Carroll, Glenn R., and Michael T. Hannan. (eds.) (2000). *The Demography of Corporations and Industries*, Princeton, NJ: Princeton University Press.
- Chamberlin, Edward H. (1965). *The Theory of Monopolistic Competition*. Cambridge, MA: Harvard University Press
- Chung, Wilbur and Arturs Kalnins. (2001). Agglomeration effects and performance: a test of the Texas lodging industry, *Strategic Management Journal*, 22, 969-988
- Cotterill, Ronald W., and Lawrence E. Haller. (1992). Barrier and queue effects: A study of leading U.S. supermarket chain entry patterns, *Journal of Industrial Economics*, 40: 427-440.
- Dawar, Niraj, and Philip Parker. (1994). Marketing Universals: Consumers Use of Brand-Name, Price, Physical Appearance and Retailer Reputation as Signals of Product Quality, *Journal of Marketing*, 58 (2), 81–95
- Day, George and David Reibstein (1997). Introduction: The dynamic challenges for theory and practice. George S. Day, and David J Reibstein, eds. *Wharton on Dynamic Competitive Strategy*. John Wiley and Sons, Inc., New York, 1 - 18
- Deephouse, David L. (1999). To be different, or to be the same? It's a question (and theory) of strategic balance, *Strategic Management Journal*, 20 (2), 147-66
- Delacroix, Jacques, and Michael E. Solt. (1988). Niche formation and foundings in the California wine industry, 1941-1984, In Glenn R. Carroll (ed.), *Ecological Models of Organizations*: 53-70, Cambridge, MA: Ballinger
- Delacroix, Jacques, and Anand Swaminathan. (1991). Cosmetic, speculative and adaptive organizational change in the California wine industry: A longitudinal study, *Administrative Science Quarterly*, 36, 631-661
- Deshpande, Rohit and Hubert Gatignon. (1994). Competitive Analysis. *Marketing Letter*, 5(3), 271-288.

- Dickson, Peter R and James L. Ginter. (1987). Market Segmentation, Product Differentiation, and Marketing Strategy, *Journal of Marketing*, 51 (2), 1-10.
- DiMaggio, Paul J . (1988). Interest and agency in institutional theory, In L.G.Zucker (ed.), *Institutional Patterns and Organizations: Culture and Environment*, 3-21, Cambridge, MA: Ballinger
- DiMaggio, Paul J. and Walter W. Powell. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields, *American Sociological Review*, 48: 147 – 160
- Dobbin, Frank, John R. Sutton, John W. Meyer, and, Richard Scott. (1993). Equal opportunity law and the construction of internal labor markets, *American Journal of Sociology*, 99: 396-427
- Dobrev, Stanislav D. (1999). The dynamics of the Bulgarian newspaper industry in a period of transition: Organizational adaptation, structural inertia and political change, *Industrial and Corporate Change*, 8, 573-605
- Dobrev, Stanislav D., and Tai-Young Kim. (2006). Positioning among organizations in a population: moves between market segments and the evolution of industry structure, *Administrative Science Quarterly*, 51, 230 - 61
- Dobrev, Stanislav D., Tai-Young Kim and Glenn R. Carroll. (2003). Shifting gears shifting niches: Organizational inertia and change in the evolution of the U.S. automobile industry, 1885-1981, *Organization Science*, 14, 264-282
- Dobrev, Stanislav D., Tai-Young Kim and Michael T. Hannan. (2001). Dynamics of niche width and resource partitioning, *American Journal of Sociology*, 106, 1299-1337
- Duda, Richard. O., Peter E. Hart, and David G. Stork. (2001). *Pattern Classification*. 2nd ed. New York: Wiley.
- Edwards, Seanicaa, Albert J. Allen, and Saleem Shaik. (2006). Market Structure Conduct Performance (SCP) Hypothesis Revisited using Stochastic Frontier Efficiency Analysis, presentation at the American Agricultural Economics Association Annual Meeting, Long Beach, California, July 23-26
- Fairen, Victor. (1996). A replicator theory model of competition through imitation in the automobile market, *Journal of Economic Behavior and Organization*, 29: 141-57
- Faulds, David J., and Subhash C. Lonial. (2001). Price-Quality Relationships of Nondurable Consumer Products: A European and United States Perspective, *Journal of Economic and Social Research*, 3 (1), 59–77.
- Fiegenbaum, Avi and Howard Thomas. (1995). Strategic groups as reference groups: Theory, modeling and empirical examination of industry and competitive strategy, *Strategic Management Journal*, 16(6), pp. 461-476

- Greve, Henrich R. (1998). Managerial cognition and the mimetic adoption of market positions: what you see is what you do, *Strategic Management Journal*, 19, 967 – 988
- Guillen, Mauro F. (2002). Structural Inertia, Imitation, and Foreign Expansion: South Korean Firms and Business Groups in China, 1987-95, *Academy of Management Journal*, 45(3), 509–525.
- Hannan, Michael T., and Glenn R. Carroll. (1992). *Dynamics of Organizational Population*, New York: Oxford University Press
- Hannan, Michael T and John Freeman. (1984). Structural inertia and organizational change, *American Sociological Review*, 49(2), 149-164
- Hannan, Michael T and John Freeman. (1989). *Organizational ecology*, Cambridge, MA: Harvard University Press.
- Hair Jr., Joseph F., Anderson, Rolph E., Ronald L. Tatham, and William C. Black. (1995). *Multivariate data analysis* (4th ed.). Upper Saddle River, NJ: PrenticeHall
- Halliday, Terrence C., Michael J. Powell, and Mark W. Granfors, (1993). After minimalism: Transformations of state bar associations from market dependence to state reliance, 1918 to 1950, *American Sociological Review*, 58, 515-535
- Hauser, John R. and Patricia Simmie. (1981). Profit maximizing perceptual positions: An integrated theory for the selection of product features and price, *Management Science*, 27 (1), 33-56.
- Haveman, Heather A. (1993a). Follow the leader: Mimetic isomorphism and entry into new markets, *Administrative Science Quarterly*, 38: 593-627.
- Haveman, Heather A.(1993b). Organizational size and change: Diversification in the savings and loan industry after deregulation, *Administrative Science Quarterly*, 38, 20-50
- Haveman, Heather A. (1994). The ecological dynamics of Organizational change: Density and mass dependence in rates of entry into new markets. In Joel A.C. Baum and Jitendra V .Singh, eds. *Evolutionary Dynamics of Organizations*: 152-66, New York: Oxford University Press
- Head, Keith, Thierry Mayer, and John Ries. (2002). Revisiting oligopolistic reaction: Are decisions on foreign direct investment strategic complements?, *Journal of Economics & Management Strategy* 11(3): 452-471.
- Henisz, Witold J. and Andrew Delios. (2001). Uncertainty, Imitation and Plant Location: Japanese Multinational Corporations, 1990–1996, *Administrative Science Quarterly*, 46 (September), 443–75.
- Hoffer, George E. and Robert J. Reilly. (1984). Automobile styling as a shift variable, *Applied Economics*, 16, 291-97.

- Huff, Anne S. (1982). Industry influences on strategy reformulation, *Strategic Management Journal*, 3(2), 119-131.
- Hutchinson, J. Wesley and Robert J. Meyer. (1994). Dynamic decision making: Optimal policies and actual behavior in sequential choice problems, *Marketing Letter*, 5(4), 369 – 382.
- Ilmakunnas, Pekka & Jukka Topi. (1999). Microeconomic and Macroeconomic Influences on Entry and Exit of Firms, *Review of Industrial Organization*, 15, 203-301.
- J.D. Power and Associates. (2002). GM Expresses New Confidence. Report, (April 24)
- Jacobsen, Robert. (1988). The Persistence of Abnormal Returns, *Strategic Management Journal*, 9(5), 415 – 430.
- Kaul, Anil and Vithala R. Rao. (1995). Research for product positioning and design decisions: An integrative review, *International Journal of Research in Marketing*, 12 (4), 293-320.
- Kennedy, Robert E. (2002). Strategy fads and competitive convergence: an empirical test for herd behavior in prime time television programming, *The Journal of industrial Economics*, 50(1), 57 - 84
- Lancaster, Kelvin J. (1971). *Consumer Demand: A New Approach*. New York: Columbia University Press
- Lancaster, Kelvin. (1979). *Variety, Equity, and Efficiency*, New York: Columbia University Press
- Lant, Theresa K. and Joel A.C. Baum. (1995). Cognitive sources of socially constructed competitive groups: Examples from the Manhattan hotel industry, In W.Richard Scott and Soren M. Christensen, eds., *The Institutional Construction of Organizations: International and Longitudinal Studies*. Sage, Thousand Oaks, CA, 15-38.
- Lieberman, Marvin B., and Shigeru Asaba. (2006). Why do firms imitate each other?, *Academy of Management Review*, 31, 366 –385
- Mansfield, Edwin. (1961). Technical change and the rate of imitation, *Econometrica*, 29, pp. 741-766.
- Masso, Jaan, Kart Rõigas, and Priit Vahter. Foreign Market Experience, Learning by Hiring and Firm Export Performance (July 19, 2014). The University of Tartu Faculty of Economics and Business Administration Working Paper No. 95-2014
- Mata, José, Pedro Portugal and Paulo Guimaraes. (1995). The Survival of New Plants: Start-Up Conditions and Post-Entry Evolution, *International Journal of Industrial Organization*, 13(4):459-481)

- Minkoff, Debra C. (1999). Bending with the wind: Strategic change and adaptation by women's and racial minority organizations, *American Journal of Sociology*, 104, 1666-1703
- Mitroff, Ian I., and Susan A. Mohrman. (1987). The slack is gone: How the United States lost its competitive edge in the world economy, *Academy of Management Executive*, 1, 65-70
- Montgomery, David B., Marian C. Moore and Joel E. Urbany (2005). Reasoning About Competitive Reactions: Evidence from Executives, *Marketing Science*, 24 (1), 138 – 149.
- Moore, Marian C. and Joel E. Urbany (1994). Blinders, fuzzy lenses, and the wrong shoes: Pitfalls in competitive conjecture, *Marketing Letter*, 5(3), 247 – 258.
- Mowery, David and Nathan Rosenberg. (1998). *Paths of Innovation: Technological Change in 20th Century America*. New York: Cambridge University Press.
- North, Douglass C. (1990). *Institutions, Institutional Change and Economic Performance*, New York: Cambridge University Press
- Palley, Thomas I. (1995). Safety in numbers: A model of managerial herd behavior, *Journal of Economic Behavior and Organization*, 28, 443– 450.
- Pauwels, Koen, Jorge Silva – Risso, Shuba Srinivasan, Dominique M. Hanssens. (2004). New Products, Sales Promotions and Firm Value, With Application to the Automobile Industry, *Journal of Marketing*, 68(4), 142-156
- Porac, Joseph F., Howard Thomas, Fiona Wilson, Douglas Paton, and Alaina Kanfer. (1995). Rivalry and the industry Model of Scottish knitwear producers, *Administrative Science Quarterly*, 40; 203-229
- Porter, Michael E. (1976). *Interbrand Choice, Strategy and Bilateral Market Power*. Cambridge, MA: Harvard University Press
- Porter, Michael E. (1980). *Competitive strategy: Techniques for analyzing industries and competitors*, New York: Free Press.
- Reger, Rhonda K. and Anne S. Huff. (1993). Strategic groups: A cognitive perspective, *Strategic Management Journal*, 14(2), 103-124.
- Reibstein, David J. and Mark J. Chussil. (1997). Putting the lesson before the test: Using simulation to analyze and develop competitive strategies. George S. Day, and David J. Reibstein, eds. *Wharton on dynamic Competitive Strategy*. John Wiley and Sons, Inc., New York, 395 – 423.
- Romanelli, Elaine, and Michael L. Tushman. (1994). Organizational transformation as punctuated equilibrium: An empirical test, *Academy of Management Journal*, 37, 1141-1166

- Rosen, Sherwin. (1974). Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition, *Journal of Political Economy*, 82 (January/February), 34-55
- Ruef, Martin. (1997). Assessing organizational fit on a dynamic landscape: an empirical test of the relative inertia thesis, *Strategic Management Journal*, 18, 837 – 53.
- Rumelt Richard P, Dan E. Schendel, David J. Teece. (1994). *Fundamental Issues in Strategy: A Research Agenda*. Harvard Business School Press: Cambridge, MA.
- Samuelson, Paul A. (1976). *Economics*. New York: McGrawHill Book Company
- Semadeni, Matthew, and Brian S. Anderson. (2010). The follower's dilemma: innovation and imitation in the professional services industry, *Academy Management Journal*, 53(5), 1175 - 1193
- Sharma, Subhash. (1996). *Applied multivariate techniques*. New York: Wiley.
- Shaw, Arch W. (1912). Some Problems in Market Distribution, *Quarterly Journal of Economics* (August), 703- 65
- Sherman, Roger and George Hoffer. (1971). Does automobile style change pay off?, *Applied Economics*, 3, 153-65.
- Singh, Jitendra V. (2006). Ecology, strategy and organizational change, In J.A.C. Baum, S.D. Dobrev, and A. van Witteioostuijn (eds.) *Advances in Strategic Management*, vol.23: Ecology and Strategy, 177-216.
- Singh. Jitendra V., Robert J. House, and David J. Tucker. (1986). Organizational change and Organizational mortality, *Administrative Science Quarterly*, 31, 587-611.
- Singh, Jitendra V., David J. Tucker, and Agnes G. Meinhard. (1991). Institutional change and ecological dynamics, In W. W. Powell and P.J. DiMaggio (eds.), *The New Institutionalism in Organizational Analysis*: 390-422, Chicago: University of Chicago Press.
- Sinkula, James M., William E. Baker, and Thomas Noordewier. (1997). A Framework for Market-Based Organizational Learning: Linking Values, Knowledge and Behavior, *Journal of Academy of Marketing Science*, 25 (4), 305-18.
- Smith, Ken G., Curtis M. Grimm, and Martin J. Gannon. (1992). *Dynamics of competitive strategy*. Newbury Park, CA: Sage.
- Sorenson, Olav. (2000). Letting the market work for you: An evolutionary perspective on product strategy, *Strategic Management Journal*, 21, 577–592.
- Sorenson, Olav. (2003). Interdependence and adaptability: Organizational learning and the long-term effect of integration, *Management Science*, 49, 446-463
- Stinchcombe, Arthur. L. (1990). *Information and Organizations*, University of California Press, Berkeley, CA.

- Sutton, John R., Frank Dobbin, John W. Meyer, and Richard W. Scott. (1994). The legalization of the workplace. *American Journal of Sociology*, 99, 944-971
- Tardiff, Joseph C. (1998). *Motor Vehicles and Motor Vehicles Equipment, US Industry Profiles*, Gale Research: New York, 394 – 401
- Thornhill, Stewart, and Raphael Amit. (2003). Learning about failure: Bankruptcy, firm age, and the resource-based view, *Organization Science*, 14(5), 497-509.
- Tuma, Nancy B. and Michael T. Hannan (1984). *Social Dynamics: Models and Methods*. Academic Press, Orlando, FL
- Urbany, Joel E. and David B. Montgomery. (1998). Rational strategic reasoning: An unnatural act?, *Marketing Letter*, 9 (August), 285 – 300.
- Uslay, Can, Z. Ayca Altintig, and Robert D. Winsor. (2010). An Empirical Examination of the “Rule of Three”: Strategy Implications for Top Management, Marketers, and Investors, *Journal of Marketing*, Vol. 74 (March), 20–39
- Yeniyurt, Sengun, Janell D. Townsend, and Mehmet B. Talay. (2007). Factors Influencing Brand Launch in a Global Marketplace, *Journal of Product Innovation Management*, 24, 471–85
- Zajac, Edward J., and Max H. Bazerman (1991). Blind spots in industry and competitor analysis: Implications of interfirm (mis)perceptions for strategic decisions. *Academy of Management Review*, 16, 47 - 56
- Zuckerman, Ezra W. (1999). The categorical imperative: Securities analysts and the illegitimacy discount, *American Journal of Sociology*, 104, 1398-438.