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ESSAYS ON THE STRATEGIC IMPLICATIONS OF MARKETING  
CAPABILITIES: MARKETING EXPLORATION AND EXPLOITATION

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Mississippi

Joseph Mitchell Price

August 2012

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## ABSTRACT

My dissertation examines how exploitation and exploration capabilities impact organizational performance for competitive advantage. The first essay reviews previous empirical, simulation, and theoretical studies to provide a synopsis and quantitative assessment of previous empirical research. The organizational performance implications of both exploration, exploitation, and their interaction (i.e., an ambidexterity) are evaluated through the substantiation of previous findings. Exploration and exploitation focus are discrete options that require a cognitive choice and are constrained by firm resources. The results show exploitation as having the greater relative impact on performance followed by exploration and ambidexterity.

Essay two conceptualizes marketing capabilities as exploitation and exploration. Drawing on longitudinal objective data from publicly-traded manufacturing and service companies, this study examines how marketing exploitation and exploration capabilities impact performance over time. Study one constructs capability measures for marketing exploitation and exploration using stochastic frontier estimation. These measures are validated through a cross-industry survey of marketing executives using previously established scales. The results show a positive relationship between marketing exploitation and current organizational performance, a positive relationship between marketing exploration and forward-looking performance, and evidence that performance is impacted by industry dynamism and firm slack. Study two, examines the mercurial nature of the capability to performance relationship through the examination of industry dynamism and firms slack as moderators. I demonstrate that in times of high dynamism marketing exploration and exploitation each have a positive impact on firm performance.

## **DEDICATION**

I dedicate this dissertation to  
my loving and supportive wife Nancy  
and sons Zachary and Jacob who have given me the love,  
support, wisdom, and “luck” to see me through to the end.

## ACKNOWLEDGEMENTS

I would like recognize the efforts of several brilliant contributors, without whose help, this dissertation would not have been possible. First and foremost, to my advisor and dissertation committee chair, Dr. Douglas Vorhies who contributed greatly to the final version of this paper made possible with his support and excellence. Second, to Dr. John Bentley who provided significant support with enthusiasm and energy. I also would like thank my committee members, Dr. Victoria Bush and Dr. Hough Sloan for their support and guidance. My committee provided me with strong support in advancing my research projects. I would also like to thank the marketing and pharmacy departments for providing me with excellent opportunity in my studies and research. Finally, I would like to thank my family for their constant love and support with a special thank you to Linda. I especially recognize my mother, Doris Price, for her encouragement and late father, Joe Price, for passing on his enduring tenacity.

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## A SYNOPSIS INTRODUCTION

Senior management knows that organizational learning is crucial to attaining and sustaining a competitive advantage. Firms struggle in gaining competitive advantage in the rapidly changing marketplace. Marketing is being called upon to efficiently service existing customers and product lines while effectively planning and the engaging in production of new customers and products. The ability of marketing to keep pace with the dynamic environments in today's markets is growing in scope and difficulty. There is a gap between the capacity of marketing organizations and their capabilities to keep up with the vast amount of information, discontinuous innovation, complex customer communications, and market segmentation (Day, 2011). The amount of information available to the firm is greater, rapidly disseminated, and not easily comprehended. Marketing organizations need to utilize adaptive learning to keep pace with dynamic environments.

Organizations learn to better serve current markets and to enter new markets through marketing exploitation and exploration learning processes, respectively. Marketing exploitation is a capability which is dynamic in nature and based on learning that refines current skills, processes and marketing capabilities in order to gain efficiencies and therefore increase the yields from serving current markets through marketing processes. Marketing exploitation also involves investing organizational resources in order to enhance current knowledge regarding organizational skills, processes and marketing capabilities. This process is characterized by refinement, efficiency, and execution. Marketing exploration is also a dynamic capability based

upon learning that provides new knowledge through the development of new skills, processes and marketing capabilities to enter new markets or challenge current marketing approaches in existing markets. Marketing exploration involves investing organizational resources in efforts to acquire entirely new knowledge in the form of skills, processes and marketing capabilities. This process is characterized by experimentation, risk-taking, and innovation.

Linking exploitation capabilities to firm performance is important because firms need to continually learn to improve the efficiency with which they serve their current customers. Marketing organizations are being called upon to better serve customers and deliver value with existing products (Mizik & Jacobson, 2003). Protecting and building brands without attention to changing customer preferences can be costly to firms. Brand image is an important aspect of building a product line and customer base and this image must be kept fresh and positive in the mind of the consumer. Capabilities in selling, advertising, and product trademarks help marketing organizations exploit what they know about their customers in order to meet and exceed performance targets.

Linking exploration capabilities to firm performance is important because organizations need to continually learn about new processes, products, and technologies to remain competitive. Innovation and new product development are critical capabilities in rapidly changing markets. Organization must keep pace with the “new” normal in order to sustain their place in the market. Exploration capabilities allow firms to gain the information needed to remain current in their marketing efforts and drive knowledge creation (Mizik & Jacobson, 2003). An organization which does not possess exploration capabilities may find their products non-competitive or obsolete. Capabilities in research and development, alliances, and patents ensure the sustainability of the organization through exploration activities.

This dissertation examines exploration and exploitation from two perspectives. The first perspective is a look back in time in order to examine what researchers have uncovered about these phenomena. The proposal of building capabilities around the concept of exploration and exploitation was presented by March (1991). Since that time, researchers have focused on many aspects of exploration and exploitation in efforts to better understand these processes. Although the benefits of using of exploitation and exploration have been discussed in the literature, studies examining the empirical link between exploitation and exploration capabilities and performance have shown mixed results. The first essay is a quantitative summation of the research on exploration and exploitation to date. This study conducts a quantitative meta-analysis using the reliability adjusted and sample size weighted study effect sizes and further evaluates the relationship between organizational learning and performance using a mixed-effects model to generate empirical generalizations.

The second perspective is broad and longitudinal in nature. A majority of previous research is limited by a cross-sectional nature as well as by being conducted in limited settings. The cross sectional approach limits researchers by viewing only a single window in time and examining what is taking place at that time. The limited settings of previous research, such as new products, patents, and alliances, also limit researchers in the generalizability of their results. The second essay is an assessment of 362 firms over 5 years across multiple industries.

This research extends previous findings and research by summarizing what is known and extending that knowledge into the marketing organization through marketing capabilities. My dissertation examines how marketing capabilities, utilizing the dimensions of exploration and exploitation, impact firm performance.

ESSAY 1

A META-ANALYTIC ASSESSMENT OF ANTECEDENTS AND RELATIVE  
IMPACT OF EXPLORATION AND EXPLOITATION ON  
FIRM PERFORMANCE

## 1. INTRODUCTION

Organizational learning is a firm capability utilized to achieve and maintain a competitive advantage by facilitating the creation of knowledge which both increases and enhances the reliability of firm performance (Dickson, 1992; March, 1991; Senge, 1990; Sinkula, 1994). Most scholars would agree that organizational learning is crucial, not only to attaining but to also sustaining a competitive advantage. Companies such as Intel and Apple have demonstrated the ability to learn and adapt as new markets emerged and others such as Timex and Schwinn have seen their competitive advantage erode. Market-based organizational learning is a primary source of sustainable competitive advantage that must overcome market complexities, exponential growth of information, and reactionary strategies. Critical factors for success include not only what to learn, but how much of it to learn, and how long it takes to learn (Day, 1991; Sinkula, 1994). The strategic decision of whether to explore “new possibilities” or exploit “old certainties” in the search of a competitive advantage is well established in the literature (Day, 1994; March, 1991). Scholars have concentrated on several antecedents and consequences of exploration and exploitation in an attempt to understand better each process’s role in creating a competitive advantage and increasing firm performance. Substantial research has also concentrated on the relationship between exploration, exploitation and firm performance in efforts to determine the impact of each of the learning processes on firm performance. This research investigates these relationships via a meta-analytic review of the empirical studies on

exploration and exploitation to assist both researchers and practitioners in the search for performance impacting practices.

The importance of driving firm performance through organizational learning processes is complex due to the temporal nature and magnitude of the performance improvements and the inherent trade-offs that must be made to pursue either exploitation or exploration (March, 1991). The external and internal conditions which foster the environment for exploration or exploitation are salient indicators to organizations as to how to pursue adaptation to environmental factors and create maximum performance (Lavie, Stettner, & Tushman, 2010). Exploitation takes advantage of existing knowledge and refers to the refinement and extension of current knowledge in order to gain efficiency and improvement in process, implementation, and execution (Atuahene-Gima, 2005; March, 1991). Exploration attempts to gain advantage by developing new knowledge, potentially in new markets, and refers to the search for new knowledge in order to provide discovery, variation, and innovation with the additional risks that accompany novelty (Atuahene-Gima, 2005; March, 1991; Srivastava, Shervani, & Fahey, 1999). Recent research has advocated pursuit of both exploration and exploitation in an ambidextrous approach which refers to firms being adept at both processes simultaneously (Lubatkin, Simsek, Yan, & Veiga, 2006; Rothaermel & Alexandre, 2009; Sarkees, Hulland, & Prescott, 2010).

Even with the volume of research on the relationship of organizational learning to performance, the results and conclusion drawn vary as to the outcome and magnitude of the relationship. The current theoretical view in the extant research is that both learning processes are positively related to performance but there are discrepancies as to which environment dictates the selection of exploration over exploitation or vice versa; or whether both exploration and exploitation can be pursued simultaneously (e.g., Sarkees, Hulland, & Prescott, 2010; Uotila,

Maula, Keil, & Zahra, 2009; Yalcinkaya, Calantone, & Griffith, 2007). Studies have examined the relationship between exploration and performance and have found a negative relationship to performance while finding a positive relationship between exploitation and performance (e.g., Kyriakopoulos & Moorman, 2004; Rothaermel & Alexandre, 2009). While another study found the performance relationship was dependent upon the desired outcome of radical or incremental innovation (e.g., Atuahene-Gima, 2005) . The relationship between exploitation and performance is also not consistently positive within the literature (e.g., Park, Chen, & Gallagher, 2002). In addition, the relationship between exploration and exploitation has produced mixed results in finding that these two constructs are positively related while other research has found the constructs are inversely related to each other (e.g., Voss, Sirdeshmukh, & Voss, 2008). Research within each of these perspective relationships provides inconsistent findings, and in addition, uncovers inconsistencies across each of the roles regarding exploration and exploitation (e.g., Auh & Menguc, 2005; Russo & Vurro, 2010).

This research will contribute to the literature on organizational learning, specifically regarding the exploration and exploitation dichotomy, by addressing some of the unanswered questions and inconsistent findings among studies in the research stream.

- What environmental antecedents impact the exploration / exploitation to performance relationship?
- What is the mean impact of each learning process on performance?
- What is the relationship between exploration and exploitation?
- Does the impact on performance vary for exploration, exploitation, and ambidexterity?
- What other study characteristics moderate the overall relationship between exploration, exploitation, ambidexterity and performance?

This meta-analytic review of the current state of research on exploration and exploitation seeks to consolidate previous studies in order to provide insight into previous studies and to help



explicate antecedents. This review will include evaluating the relationship between exploration and exploitation in order to further our understanding of these constructs. This assessment will also examine the impact of each type of learning process on firm performance.

This manuscript will proceed with the following structure. First, this study will provide a concise assessment of the current literature with respect to the antecedents used in prior empirical research studies. Second, a discussion of the database development for the study will be presented. Third, this study will assess the current state of the empirical research on exploration and exploitation by estimating mean values and range of effects with previously studied antecedents and consequences with regard to effect sizes. This assessment will include aggregating the findings across studies to determine the impact, direction and magnitude, on firm performance. Fourth, an analysis of the relative impact of each learning process on firm performance is presented. Finally, this study will conclude by offering a discussion of the results and implications followed by a discussion of research limitations and future research directions to further develop this research area.

## 2. THEORETICAL FRAMEWORK AND RESEARCH HYPOTHESES

### *2.1 Exploitation, Exploration, and Conceptual Framework*

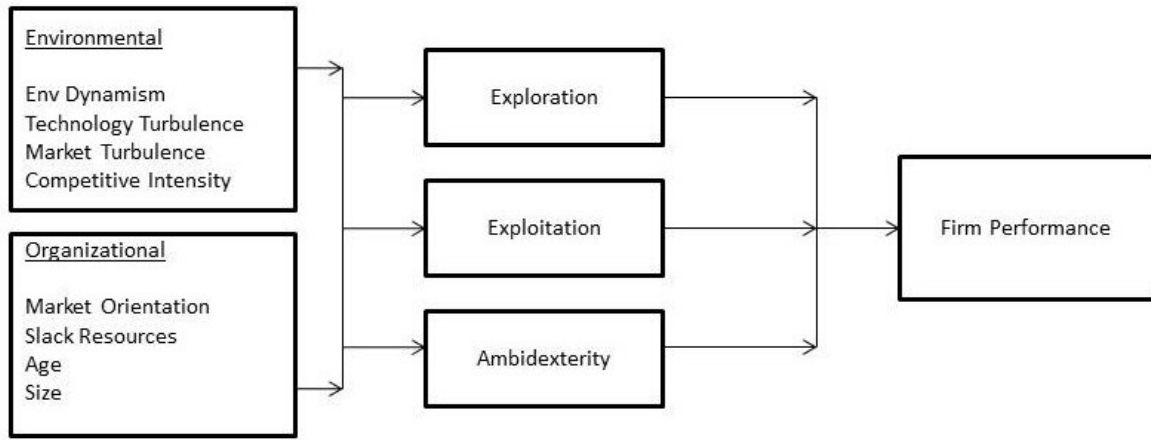
The conceptual framework for the bivariate analysis (see Figure 1-1) development was based on the existing exploration and exploitation research for this meta analytic research (Gupta, Smith, & Shalley, 2006; Kyriakopoulos & Moorman, 2004; Lavie, Stettner, & Tushman, 2010; Menguc & Auh, 2008; Vorhies, Orr, & Bush, 2010). This model includes the most studied antecedents and consequences in the literature on the exploitation and exploration to performance relationships. Previous research provides the theoretical basis for the inclusion of each of the antecedents and consequences so the discussion of these constructs will be brief.

The unit of analysis in this meta-analytic study is the organization or firm. While other studies have emphasized the individual or team, this research will focus on a more macro perspective. Previous literature has created some ambiguity in the definitions and implications of the central constructs of this study. It is imperative the empirical definitions are consistent with the conceptual definitions (Gupta, Smith, & Shalley, 2006). Exploration and exploitation are two distinct learning processes by which organizations increase their knowledge regarding products, technologies, capabilities, and markets. These learning processes are distinguished by the type of learning that explicitly occurs within the organization. Each involves the creation of organizational knowledge with exploration referring to the scope of new knowledge that goes beyond what is currently known through the experimentation with new alternatives and

exploitation referring to the scope of new knowledge that enhances and extends existing capabilities and paradigms (March, 1991; Vorhies, Orr, & Bush, 2010).

Ambidexterity was included in this research because of the recent attention given to ambidexterity in the literature (e.g., He & Wong, 2004; Menguc & Auh, 2008; Sarkees, Hlland, & Prescott, 2010). The literature on ambidexterity also emphasizes the tension between the two processes as a key strategic challenge for creating and sustaining a competitive advantage (Raisch, Birkinshaw, Probst, & Tushman, 2009). Ambidexterity is the concurrent exercise of high levels of both processes or capabilities and this simultaneous pursuit is often viewed as an ambidextrous strategy. The concept of ambidexterity is based on an organization's ability to simultaneously perform differing and often competing, strategic acts (Simsek, 2009).

FIGURE 1-1: ANTECEDENTS AND CONSEQUENCES CONCEPTUAL MODEL



## 2.2 Antecedents of Exploration, Exploitation, and Ambidexterity

Previous empirical research has provided convoluted evidence as to the causes and antecedents of exploration and exploitation. This study seeks to collate previous research into a manageable framework and will classify the antecedents into two broad categories: environmental and organizational factors (e.g., Lavie, Stettner, & Tushman, 2010).

*Environmental antecedents.* Environmental forces influence the organizational learning focus by introducing turbulence and dynamism into the environment. These forces create uncertainty in the organization by introducing changes into the market and technology bases as well as changes in the levels of competitive intensity. Environmental dynamism refers to the amount of instability, rate of change, and unpredictability of environmental factors which impact key market and industry conditions (Dess & Beard, 1984). Market turbulence refers to the degree and frequency of change in the market or market structure over time. Technology turbulence refers to the rate and magnitude of changes in the market or industry which are due to the instability and unpredictability of existing technology base (Han, Kim, & Srivastava, 1998).

Competitive intensity refers to the pressures which result from the number of competitors and the extent to which organizations compete with one another for limited resources (Porter, 1980).

*Organizational antecedents.* Organizational factors are associated with resources, capabilities, structure, age and size of the organization. Resources, specifically slack resources, refer to the availability of excess organizational resources which may be a result of prior performance (Voss, Sirdeshmukh, & Voss, 2008). Market orientation has been conceptualized from behavioral and cultural perspectives. The behavioral perspective from Kohli and Jaworski (1990) concentrates on organizational activities that are related to the generation, dissemination, and responsiveness to market intelligence. The cultural perspective, Narver and Slater (1990), focuses on organizational norms and values that promote behaviors of market orientation. Organizational age refers to the length of time the organization has been in existence which impacts the level of evolution and the degree to which, processes and resources are established. Organizational size refers to the size of the organization, which impacts the level of resources which can be effectively deployed.

### ***2.3 Consequences of Exploration, Exploitation, and Ambidexterity***

Firm performance is the primary consequence of exploration and exploitation. Organizational performance should be enhanced by exploration and exploitation activities through differential performance effects. Both processes have performance impacting consequences on the organization. Researchers have sometimes viewed the performance implications of exploration and exploitation as a compromise between the long-run and the short-term impact of each (Sinkula, Baker, & Noordewier, 1997). Exploitation is associated with learning in order to gain the benefits of efficiencies in existing operations and is focused on the firm's ability to extract performance gains from existing operations (Kyriakopoulos & Moorman,

2004). “Exploitation includes such things as refinement, choice, production, efficiency, selection, implementation, execution” (March, 1991, p. 71). Exploration is associated learning that is needed to produce radical or disruptive innovation with which the organization has the potential to sustain long-run performance gains (Atuahene-Gima, 2005) and focused on the firm’s ability to adapt market changes through radical change and experimentation (Katila & Ahuja, 2002). “Exploration includes things captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery, innovation” (March, 1991, p. 71). Organizational performance has been categorized in previous research along the lines of exploration and exploitation in terms of effectiveness and efficiencies in an effort to reflect their appropriate contributions to performance. The distinction of exploration and exploitation or exploratory and exploitative innovation (Benner & Tushman, 2003) outcomes has recently become of increasing interest to researchers as well as the organizational adaptation to the environment (e.g., Benner & Tushman, 2003; Holmqvist, 2004; Jansen, Vera, & Crossan, 2009; Levinthal & March, 1993). Organizations engage in exploration in order to attain new knowledge and develop products for emerging customers and markets. Organizations engage in exploitation to capitalize on existing knowledge and extend existing products for current markets (Jansen, Van Den Bosch, & Volberda, 2006). There is substantial variation regarding the performance relationship between studies, but in line with predominate theory and following March (1991), I posit:

*H1: Exploration and exploitation will be positively related to performance, in addition the combined effect, ambidexterity, will also be positively related to performance.*

#### ***2.4 Exploration/Exploitation Relationship***

The relationship between exploration and exploitation has important consequences for researchers. The distinction of this relationship is an important factor, which must be considered

in evaluating current research as well as formulating future research. This distinction also has relevance because how the two processes are related impacts the measurement of each construct and the measurement or possibility of measurement of a combined construct as well as the measurement of their outcomes. The literature presents three possible relationships: a single construct, orthogonal, and along a continuum.

Lavie (2010) argues for the need to consolidate the measures of exploration and exploitation into a single measure. The need for a single metric is centered on the idea that there are inconsistent approaches for modeling the balance between exploration and exploitation. Research is mixed on the best method to separately measure exploration and exploitation and the best method with which to combine them into a single measure. Operationalization's of additive, subtractive, multiplicative, or relative functions as in ratios have been used in previous studies with each of these methods potentially being sensitive to the choice of model used in the study (Lavie, Stettner, & Tushman, 2010).

There are studies which advocate that these two constructs are orthogonal (e.g., Gupta, Smith, & Shalley, 2006; Mudambi & Swift, 2011; Sarkees, Hulland, & Prescott, 2010). The orthogonal perspective views the constructs as independent, in that they are complementary, and high levels of each may coexist. Additional research has viewed exploration and exploitation as orthogonal constructs that can coexist within teams or organizations (e.g., Beckman, Haunschild, & Phillips, 2004), in innovation (e.g., Atuahene-Gima, 2005; Ireland & Webb, 2009; Jansen, Van Den Bosch, & Volberda, 2006), and in alliances (e.g., Benner & Tushman, 2003; Rothaermel & Deeds, 2004). The emergence of this perspective is associated with the development of the concept of ambidexterity, which is defined as the simultaneous pursuit of both radical and incremental learning (Tushman & O'Reilly, 1996). Support for the orthogonal

view is provided from empirical studies which have found significant relationships between firms which exhibit superior performance due to high levels of both exploration and exploitation. Recent research has indicated that simultaneous pursuit of exploration and exploitation may result in superior performance (Katila & Ahuja, 2002; Sarkees, Hulland, & Prescott, 2010). Support for orthogonality is not consistent across empirical studies with supporting evidence provided by some studies (e.g., Gilson, Mathieu, Shalley, & Ruddy, 2005; He & Wong, 2004; Jansen, Van Den Bosch, & Volberda, 2006) and contradictory evidence provided in others (e.g., Lavie & Rosenkopf, 2006; Uotila, Maula, Keil, et al., 2009).

In the seminal work of March (1991), the argument goes, exploration and exploitation compete for scarce resources, focus, and processes which indicate these constructs should be viewed as two ends of a continuum (e.g., Mc Namara & Baden-Fuller, 2007). This continuum can be defined as ranging from exploration on one end to exploitation on the other end with high levels of one dictating low levels of the other. Support for the continuity argument is supported by the argument exploration generates more exploration and exploitation leads to more exploitation (Gupta, Smith, & Shalley, 2006). The ability to acquire and develop new knowledge is dependent upon the organization's current knowledge base (Cohen & Levinthal, 1990). Support for the continuity argument is also found in the concept that exploration evolves into exploitation which is a natural cycle (Rothaermel & Deeds, 2004). There are several studies that focus on these constructs as being on a continuum (e.g., Ebben & Johnson, 2005; Mc Namara & Baden-Fuller, 2007) but there has been very little evidence produced from empirical studies that support the premise that exploration and exploitation lie on a continuum. Some studies report negative correlations between exploration and exploitation (e.g., Park, Chen, & Gallagher, 2002; e.g., Voss, Sirdeshmukh, & Voss, 2008) and other studies do not even find a significant



association between the constructs (e.g., Jansen, Van Den Bosch, & Volberda, 2006). In order for research to support the premise that these two constructs lie on a continuum, at any given point in time the correlations between exploration and exploitation should be inversely related (Lavie, Stettner, & Tushman, 2010). There are also benefits to be gained in the evaluation of each construct as opposed to a single construct by extending the granularity of studies. There is evidence in the literature to oppose the continuum view of this relationship which can be evaluated with correlations. Since organizational learning theory portrays the processes as competing and value is added for the discrete construct viewpoint, I posit:

*H2: Exploitation and exploration are positively related to one another.*

## ***2.5 Organizational Learning and Performance***

The conceptual framework for the performance relationship analysis is an extension of the previous framework and based upon organizational learning theory. The dependent variable is firm performance. The relationship between organizational learning and performance may vary based upon the choice of which learning process is engaged: exploration, exploitation, or ambidexterity. Other study characteristics are examined as potential moderators of the organizational learning to performance relationship.

Since the introduction of exploration and exploitation into organizational learning theory by March (1991), the literature has attempted to resolve inconsistent findings and various perspectives on these phenomena. These organizational phenomena have been used to research and study organizational learning, innovation, marketing capabilities, strategic alliances, and competitive advantage (e.g., Atuahene-Gima, 2005; Benner & Tushman, 2003; Hoang & Rothaermel, 2010; Sarkees, Hulland, & Prescott, 2010; Tu, 2010; Vorhies, Orr, & Bush, 2010; Voss, Sirdeshmukh, & Voss, 2008; Yalcinkaya, Calantone, & Griffith, 2007; Zhang, Di

Benedetto, & Hoenig, 2009). Even with the breadth of study that has occurred to date this research area is still lacking a depth aspect which is needed to answer some perplexing questions regarding these phenomena (Gupta, Smith, & Shalley, 2006; Lavie, Stettner, & Tushman, 2010).

March (1991) argues that all organizations need to strive for capabilities in both exploration and exploitation because superior performance and persistent success requires that organizations be proficient at both. Most research in this area advocates that organizations need to excel at both exploration and exploitation but there is no consensus on how best to achieve this proficiency. Organizations can maintain a focus on one capability while maintaining sufficient minimum levels of the other as in the case of "sufficient exploitation to ensure its current viability and, at the same time, devote sufficient attention to exploration in order to ensure the organization's future viability" (Levinthal & March, 1993, p. 105) or vice versa. All markets and industries are not equal and external forces play a large role in their defining characteristics (Porter, 1980). Strategic choice theory contends that organizations are able to adopt a strategy which fits their core capabilities (Child, 1972, 1977). The literature has recognized the possibility of specialized organizations being viable and effective for generating persistent survival (Benner & Tushman, 2003).

Exploitation learning refines and extends existing product knowledge, skills, and processes with the aim of achieving greater operational efficiency and reliability of existing capabilities. These benefits may be realized with less managerial effort in the form of interfunctional coordination than exploration activities (Atuahene-Gima, 2005). Organizational learning theory indicates that exploitation provides returns in a shorter time frame and is less risky than exploration processes. "The certainty, speed, proximity, and clarity of feedback ties exploitation to its consequences more quickly and more precisely than is the case with

exploration” (March, 1991, p. 73). Learning through exploitation also provides a stronger foundation for improving marketing capabilities than marketing exploration. These improvements in marketing capabilities are positively related to objective measures of firm performance (Vorhies, Orr, & Bush, 2010).

Exploration is necessary for the attainment of new knowledge and the development of new competencies to prevent or reduce the future risk of becoming obsolete (Holmqvist, 2004; Leonard-Barton, 1992). Organizations engage in exploration desiring long-term performance gains by allocating resources to innovation and discovery activities thus enhancing an organization's future adaptability at the expense of incurring greater risk and opportunity costs in the near term. The organizational need for exploration may depend upon the need for new and innovative approaches to markets. Competitive pressures and environmental dynamism may require organizations to seek exploitative innovation in order to increase performance and address dramatic change (Lin, Haibin, & Demirkan, 2007). The conditions and factors that drive the need for radically new approaches through exploration may occur less frequently than the need for operational efficiencies through exploitation. In addition, the increased risk associated with exploration activities denotes the lower probability of the success of these endeavors.

Ambidexterity is an approach to learning which implies that high-levels of exploration and exploitation attain the best performance. This approach signifies an organization's ability to synchronously and simultaneously pursue both contradictory knowledge-processing capabilities with equal dexterity (Lubatkin, Simsek, Yan, et al., 2006). Organizational theory postulates exploration and exploitation are conflicting domains and compete for the same scarce resources. Managerial decisions must include compromise in the pursuit of one for the other. This is supported by finite resource theory in that resources are constrained and that strategic and

tactical decisions must be made with the resources available. Extant theory also states that exploration carries a higher risk than exploitation, therefore to pursue high levels of both would carry the greatest risk. Eisenhardt (2000) notes that this risk may be reflected in stating this critical balance may lie between the 'edge of chaos' and great rewards. In addition to the difficulty of managing the two opposing processes, the cost of exploration has the potential to have high and undesirable costs for the firm (March 1991; Nerkar 2003). Engaging in high levels of either exploration or exploitation may be counter-productive to organizational goals. For example, high levels of exploration weaken the relationship between the marketing capabilities of brand management and customer relationship management and performance. This may be due to the exploration activities consuming valuable resources needed for performance gains through exploitation (Vorhies, Orr, & Bush, 2010).

Exploration and exploitation are each considered to have the potential for a positive impact on firm performance. The ambidexterity perspective of pursuing each process simultaneously may not have a more beneficial performance impact than pursuing each process independently as existing in conflicting domains. It is possible that both exploitation and exploration require a little dose of each other to achieve performance gains from either. The ability to acquire and develop new knowledge depends to an extent on an organization's current knowledge base (Cohen & Levinthal, 1990). Both processes are dependent upon the organization's current knowledge base. Exploitation is dependent on the current base to achieve organizational performance gains through refinement of current knowledge. Exploration is dependent upon the current knowledge base for the selection of and development of new knowledge which builds upon this base.

In effect, exploration processes are more risky, carry more costs, and require more managerial effort and coordination. The combination of these processes, exploration and exploitation through ambidexterity, further increases these factors. While, the performance relationship may be stronger for exploration than exploitation, success occurs with much less frequency and at a higher cost. However, there may be certain conditions which dictate the necessity for exploration activities. Therefore, the following hypotheses are based on general normal conditions of operation and not specific periods of turbulence or dynamism.

Organizational learning through exploitation typically leads to greater performance than exploration or ambidexterity. Relying upon the above logic constructed around risk, reward and cost, I posit:

*H3: The organizational learning to performance relationship is stronger for exploitation than for exploration.*

*H4: The organizational learning to performance relationship is stronger for exploitation than for ambidexterity.*

*H5: The organizational learning to performance relationship is stronger for exploration than for ambidexterity.*

In the examination of the preceding hypotheses, the analysis should also consider other study characteristics. Study characteristics may influence the organizational learning to performance relationship. The characteristics used for this analysis include the structure of the organization, method of exploration and exploitation measurement, and method of firm performance measurement. Large organizations may be organized into multiple Strategic Business Units (SBUs). Since the unit of analysis for this study is the organization, there may be differences in single business unit firms versus multiple business unit firms. The measurement of exploration or exploitation can be categorized into the use of proxies or survey instruments.

The measurement of firm performance can be categorized into the use of subjective or objective performance metrics.

*Single versus multiple business units.* In large organizations, the SBU is considered to be equivalent to the organizational level in smaller or single business unit firms and has been studied as such in marketing strategy (e.g., Matsuno, Mentzer, & Özsoy, 2002; Menon, Bharadwaj, Adidam, & Edison, 1999; Moorman & Rust, 1999). A single SBU structure is simplistic compared to the large and diverse organizational structures found in larger multiple business unit firms. These diverse structures are considered additional resources which an SBU may not possess. These additional resources may impact an organizations ability to simultaneously pursue exploitation and exploration through an ambidextrous strategy.

*Proxy versus survey data.* The measurement method of exploration and exploitation may have an impact on the process to performance relationship. Each of the organizational learning processes are difficult to measure as indicated by the number of survey instruments used across studies. These enigmatic constructs present real dilemma for researchers to accurately measure achieving high reliability and validity. Proxies for each process are used in some studies in effort to better capture the organizational objectives of firms. Examples of proxies used for measurement include patent cites (Park, Chen, & Gallagher, 2002), alliance types (Lin, Haibin, & Demirkan, 2007), and technology sourcing (Rothaermel & Alexandre, 2009). The complexity within the organization is a source of difficulty in using proxies to measure these complex constructs. Proxies may only capture one dimension of organizational learning. Therefore, the organizational learning to performance relationship may be stronger when survey instruments are used to measure exploitation and exploration versus proxies.

*Subjective versus objective data.* The measurement of firm performance may also have an impact on the organizational learning to performance relationship. The strength of the relationship between the learning processes and performance could vary according to the type of data used in a study. Firm performance can be measured on multiple dimensions, two of which are efficiency and effectiveness. Furthermore, because performance is relational to competitors and economic conditions which are difficult to capture with objective data, objective measures lack insight. In addition, common methods bias could potentially inflate the correlations obtained from subjective data. For these reasons, the organizational learning to performance relationship may be stronger when subjective data rather than objective data is used to measure performance.

### 3. METHOD, DATA, & MEASURES

#### ***3.1 Data Collection Procedure***

The method used in this meta-analysis includes the construction of a database containing relevant studies, a bivariate analysis of the correlations, and an evaluation of the organizational learning to performance relationship using a mixed effects regression model. The construction of the database and the selection of pertinent studies are described in the following section. The bivariate analysis of the antecedents and consequences follows the approach prescribed by Hedges and Olkin (1985) with the addition of correlation correction for attenuation as Hunter and Schmidt (1990) recommend. The mixed-effects model follows methods as described by Singer (1998) and used by Krasnikov and Jayachandran (2008). This procedure will assess the relative impact of the organizational learning processes to firm performance relationship and include an assessment of study characteristics on that relationship. Each of the method elements will be discussed in detail in the following sections.

#### ***3.2 Database Development and Search Process***

The procedures used to construct the database are consistent with previous meta-analyses in the marketing literature (Brown & Peterson, 1993; Kirca, Jayachandran, & Bearden, 2005; Krasnikov & Jayachandran, 2008). The studies on exploration and exploitation are diverse and varied, and due to this aspect the search for empirical studies to ensure representativeness and completeness was complex and exhaustive. The comprehensive list of studies was created by employing several methods in the literature search, including (1) a search of the ABI/INFORM,



Science Direct, and Business Source Premier databases using the keywords and phrases such as “exploitation”, “exploration”, “ambidexterity”, and “rigidity; (2) a search of ProQuest and Social Science Research Network for dissertations on exploration and exploitation; (3) a search of the Social Sciences Citation Index that referred to the three most highly cited articles in the exploration and exploitation literature (Benner & Tushman, 2002; Gupta, Smith, & Shalley, 2006; March, 1991); (4) manual shelf searches of journals; (5) emails and listserv postings sent to researchers in an effort to obtain unpublished research to address the “file-drawer” problem (Rosenthal, 1979, 1992).

The selection of studies, from February 1991 to March 2012, for inclusion in the meta-analysis was based upon two criteria. One, the meta-analysis will only include studies that reported the *r*-family of effects (Rosenthal, 1991). Two, only studies that used the organization or firm as a unit of analysis were selected to distinguish the research results and not aggregate studies that had vastly divergent goals (Hunter & Schmidt, 1990). This search generated more than 150 published and unpublished studies. These studies consisted of conceptual, historical, simulation, and empirical studies, each of which was evaluated for empirical measures of the relationships among antecedents and outcomes. Because the number of unpublished studies was small, only published studies were included in the database.

The final database was developed following procedures from recent marketing literature (Kirca, Jayachandran, & Bearden, 2005; Krasnikov & Jayachandran, 2008). The resulting catalogue of empirical studies was further refined to yield the final list for inclusion. Some studies could not be included because their results were reported only in multivariate models (4 studies), the unit of analysis was not at the firm level (10 studies), or no usable correlations were present in the study (6 studies). The inclusion rate of 68% of the empirical studies is comparable

to other meta-analyses in marketing by Kirca, Jayachandran, & Bearden (2005; 61%) and Brown & Peterson (1993; 66%). In the case of missing reliabilities the sample-size-weighted mean reliabilities from the remaining studies as reliability estimates was used (Hunter & Schmidt, 1990). Three studies were not included because outlier analysis indicated their sample size would have a biased impact on the weight given to the correlations from these studies. Analysis was run with the studies included and excluded which provided confirmation of this bias (Hunter & Schmidt, 1990).

The final determination for the inclusion or rejection of studies was based on a coding protocol which specified the type of information to be collected from each study, unit of analysis, and definition for each of the constructs. An independent evaluator and the author were used to code the studies and the independent evaluator was not familiar with the research focus of the study. The initial agreement was approximately 88% and the overall agreement between the coders approximately 96% with differences being resolved through discussion (Szymanski & Henard, 2001). Procedures utilized in other marketing meta-analyses were followed in the construction of the final dataset (e.g., Brown & Peterson, 1993; Szymanski & Henard, 2001). A complete bibliography of the studies included in the meta-analysis is available from the author.

After compiling the data, the effects from each study were adjusted for reliability using the approach that Hunter and Schmidt (1990) recommend, correction for attenuation. This correction divided the correlations by the square root of the product of the reliabilities of the two correlated constructs. Next, the reliability-corrected correlations were transformed into z-values (Hedges and Olkin 1985). Then, the weighted mean of the z-scores were calculated using the inverse of their variance ( $N - 3$ ) as weight, where N is the sample size. Finally, the z-scores were transformed back to obtain the revised correlation coefficients (Hedges and Olkin 1985) and the

95% confidence intervals (Rosenthal, 1991; Shadish & Haddock, 1994). The final steps in the analysis were the computations addressing the file-drawer problem and homogeneity. The classic file drawer N provides a measure of the availability bias by calculating the number of insignificant studies needed to reduce the cumulative effect to the point of nonsignificance (Rosenthal, 1991). Finally, the Q statistic test of homogeneity was calculated (Hedges & Olkin, 1985).

## 4. RESULTS

### *4.1 Quantitative Summary of the Bivariate Relationships of the Antecedents & Consequences*

Data contained in Table 1-1 summarizes the bivariate correlations for the relationships between exploration, exploitation and ambidexterity and their antecedents and consequences (see Figure 1-1). The total effect sizes collected for the antecedents of exploration and exploitation were 79 and 75 respectively. The total effect sizes collected for the relationship between exploration and exploitation were 41. The total effect sizes collected for the consequences of exploration, exploitation, and ambidexterity were 38, 38, and 15 respectively. When studies provided more than one effect size estimate, in this case effectiveness and efficiency, the average effect was used to eliminate the disproportionate influence of the study (Grewal, Kavanoor, Fern, Costley, & Barnes, 1997; Kirca, Jayachandran, & Bearden, 2005).

First, the correlations between exploration and the antecedents are evaluated. Significant, positive reliability-corrected mean correlations were found for the relationships between the antecedents of exploration: technology turbulence ( $r=.18, p<.05$ ), environmental dynamism ( $r=.31, p<.05$ ), market turbulence ( $r=.05, p<.05$ ), unabsorbed slack ( $r=.15, p<.05$ ), market orientation ( $r=.18, p<.05$ ), and firm size ( $r=.10, p<.05$ ). Next, I present the correlations of the exploitation antecedents. Significant, positive correlations were found for the relationships between the antecedents of exploitation: environmental dynamism ( $r=.25, p<.05$ ), market turbulence ( $r=.06, p<.05$ ), competitive intensity ( $r=.11, p<.05$ ), unabsorbed slack ( $r=.15, p<.05$ ), and market orientation ( $r=.35, p<.05$ ). Significant, correlations were also found for firm size ( $r=$

.09,  $p < .05$ ). Next, the correlations between ambidexterity and the antecedents are evaluated. The number of effects for the antecedents of ambidexterity is smaller due to the limited number of ambidexterity studies to date. Significant, positive correlations were found for the relationships between the antecedents of ambidexterity: environmental dynamism ( $r = .19$ ,  $p < .05$ ) and firm size ( $r = .05$ ,  $p < .05$ ).

The relationship between the consequence, performance, and exploration was positive and significant ( $r = .19$ ,  $p < .05$ ) as well as the relationship to exploitation ( $r = .22$ ,  $p < .05$ ). The ambidexterity to performance relationship was also significant and positive ( $r = .13$ ,  $p < .05$ ). Thus, H1 stated that a positive relationship to performance would exist between not only exploration and exploitation but also ambidexterity. Thus H1 is supported. The relationship between exploration and exploitation also has a significant, positive reliability-corrected mean correlation ( $r = .24$ ,  $p < .05$ ) supporting H2.

All Q-statistic tests for homogeneity for the firm performance consequence are significant, demonstrating statistical heterogeneity and supporting further research for moderation analysis. The performance consequences of ambidexterity have received significant attention recently. This study does not provide expectation of this relationship being significant, but the number of studies is small in this analysis. The numbers for availability bias reported in Table 1 indicate that new or unpublished studies not included in the meta-analysis do not represent serious threats to the validity of the findings for the bivariate relationships we discussed previously (Lipsey & Wilson, 2001) with the exception of the relationship between exploitation and competitive intensity and environmental dynamism.

TABLE 1-1: DESCRIPTIVE STATISTICS AND META-ANALYSIS

**Results: Descriptive Statistics and Influence of Antecedents and Relationships**

Proposed Relationships	Number of Effects	Total Sample Size	Simple Average r	Average Adjusted for Reliability	Sample-Weighted Reliability-Adjusted Average r	Range of r	95% CI	Availability Bias	Q Statistic (d.f.)
<b>Antecedents of Exploration</b>									
Technology Turbulence	8	1234	.14	.19	.18*	-.04 - .23	.13 - .24	96	15.19 (7)
Environmental Dynamism	9	1442	.22	.29	.31*	-.26 - .56	.27 - .37	359	111.46 (8)
Market Turbulence	9	2036	.07	.04	.05*	-.09 - .22	.00 - .09	26	35.52 (8)
Competitive Intensity	4	677	-.06	.01	.02	-.37 - .16	-.06 - .09		31.56 (3)
Unabsorbed Slack	4	894	.11	.14	.15*	.02 - .32	.08 - .21	25	22.13 (3)
Market Orientation	4	708	.16	.18	.18*	.10 - .28	.11 - .26	34	6.51 (3)
Firm Size	28	6902	.07	.10	.10*	-.31 - .58	.08 - .13	455	293.83 (27)
Firm Age	13	2937	.00	.01	.01	-.11 - .23	-.03 - .04		30.31 (12)
<b>Antecedents of Exploitation</b>									
Technology Turbulence	8	1234	.02	.04	.03	-.06 - .10	-.02 - .09		3.76 (7)
Environmental Dynamism	9	1442	.18	.22	.25*	-.25 - .56	.20 - .31	242	104.41 (8)
Market Turbulence	8	1762	.05	.07	.06*	-.15 - .13	.02 - .11	15	12.97 (7)
Competitive Intensity	4	677	.02	.10	.11*	-.30 - .26	.04 - .19	4	35.03 (3)
Unabsorbed Slack	3	620	.10	.15	.15*	-.06 - .32	.07 - .23	11	48.03 (2)
Market Orientation	4	708	.24	.34	.35*	.12 - .38	.29 - .44	100	13.87 (3)
Firm Size	27	6554	.06	.08	.09*	-.16 - .55	.07 - .11	309	223.96 (26)
Firm Age	12	2660	.00	-.02	-.02	-.09 - .23	-.06 - .02		29.61 (11)
<b>Antecedents of Ambidexterity</b>									
Environmental Dynamism	5	875	.17	.18	.19*	-.14 - .36	.12 - .26	59	19.38 (4)
Firm Size	13	2921	.08	.04	.05*	-.09 - .25	.01 - .08	64	51.21 (12)
Firm Age	7	1783	.02	-.02	-.02	-.09 - .14	-.07 - .02		17.52 (6)
<b>Relationship</b>									
Exploration -> Exploitation	41	9229	.29	.22	.24*	-.63 - .74	.23 - .27	9944	2494.57 (40)
<b>Performance Consequences</b>									
Exploration	38	9165	.25	.18	.19*	-.15 - .60	.18 - .22	5903.36	648.47 (37)
Exploitation	38	9039	.25	.21	.22*	-.08 - .71	.21 - .25	6520.54	559.36 (37)
Ambidexterity	15	2739	.10	.12	.13*	-.29 - .42	.09 - .17	213.03	156.89 (14)

\*Significant at  $p < .05$ .

#### ***4.2 A Mixed Effects Model: Hypothesis Testing and the Impact of Study Characteristics of the Organizational Learning to Performance Relationship***

In order to assess the relative impact of exploitation, exploration, and ambidexterity, on the performance relationship (H3–H5), this analysis implemented a mixed-effects model. The harvested effect sizes are nested within studies. Therefore, traditional regression analysis may not be appropriate, because traditional regression has the potential to produce biased estimates. A mixed-effect model is advocated by Lipsey & Wilson (2001) to address the nested structure of the data and to produce more generalizable results. Hierarchical Linear Modeling (HLM) is a special case of mixed-effects models which accounts for the nested structure of the data by modeling within-study and between-study variances. The mixed-effects model employed in this study assumes that the two types of variations in effect sizes can be explained by the type of organizational learning process and performance variables, as well as other study characteristics. This analysis is consistent with previous marketing research following Krasnikov & Jayachandran (2008). The model is as follows:

$$(1a) \quad \text{Level 1: } Z_{ij} = \beta_{0j} + \beta_{1j} \times X_{1ij} + \beta_{2j} \times X_{2ij} + \varepsilon_{ij} , \text{ and}$$

$$(1b) \quad \text{Level 2: } \beta_{nj} = \gamma_{n0} + \sum_{k=1}^k \gamma_{nk} \times U_{kj} + u_{nj}$$

Where  $Z_{ij}$  represents the  $i$ th effect size reported in the  $j$ th sample where  $j = 1 - 93$  when ambidexterity is in the model and where  $j = 1 - 78$  when ambidexterity is removed from the model.  $\beta_{1j}$  and  $\beta_{2j}$  describe the parameter estimates or slopes for the two categorical variables exploration ( $X_{1j}$ ) and ambidexterity ( $X_{2j}$ ), further explained

$X_{1ij} = 1$  if the correlation is between exploration and performance and 0 if otherwise and

$X_{2ij} = 1$  if the correlation is between ambidexterity and performance and 0 if otherwise.

The Level 1 equation (1a) describes the impact of the different learning process and performance measures, which vary at a study level, whereas the Level 2 equation (1b) describes the effect of study characteristics on the intercept and slopes in the Level 1 equation. The study characteristics coding scheme is explained:

$U_{1j}$  = Proxy (1) versus survey measure (0) for learning process,

$U_{2j}$  = Subjective (1) versus objective (0) performance measures,

$U_{3j}$  = SBU (1) versus larger, multiple business unit (0) firms, and

$U_{4j}$  = The interaction of SBU ( $U_{3j}$ ) and ambidexterity ( $X_{2ij}$ ).

In addition,  $\gamma_{n0}$  ( $n = 0 - 2$ ) represents the fixed effects in the intercept and slopes  $\beta_{nj}$ , and  $u_{nj}$  ( $n = 0 - 2$ ) describes the between studies unexplained variance in the intercept and slope after the partitioning of the effects of study and sample variables.

For the test of the hypotheses, the z-transformed values of the corrected for attenuation correlations between the learning processes and performance were used as the dependent variable. First, we estimated the intraclass correlation coefficient ( $\rho$ ), the proportion of within-study variance to the total variance (Raudenbush & Bryk, 2001; Singer, 1998). The within-study ( $\sigma^2$ ) and between-study ( $\tau_{00}$ ) variance components are significant and equal to .063 ( $p < .001$ ) and .031 ( $p < .001$ ), respectively. The intraclass correlation coefficient  $\rho$  derived from these estimates was .33 (.031/.94), indicating that about a third, 33 percent, of the observed variance was between studies and that a fair amount of clustering of effect sizes occurred within studies. This confirms the use of HLM as an appropriate tool (Raudenbush & Bryk, 2001). The following analysis used in the estimation of the HLM followed procedures consistent with recent marketing research (Krasnikov & Jayachandran, 2008) and used the approach outlined by Singer (1998).



The model with random effects in the intercept and all three slopes did not converge. Therefore, we analyzed alternative models with random effects in different combinations of slopes and the intercept. The mixed-effects model with random effects only in the intercept had a better fit ( $-2LLR = 39.2$ , Akaike information criterion = 43.2, and Schwarz's Bayesian criterion = 46.9) than the model with only fixed effects in the intercept and all slopes ( $-2LLR = 54.1$ , Akaike information criterion = 56.1, and Schwarz's Bayesian criterion = 58.6). These measures provide strong evidence of better fit for the model selected (Raftery, 1995). The models with random effects in the intercept and any combination of slopes did not demonstrate improvements in fit. Therefore, for hypotheses testing, we used the model with fixed effects in the slopes and random effects in the intercept. The relevant parameter estimates for the mixed-effects model appear in Table 1-2.

The performance contrasts were not significant. Again, caution must be used in the results from ambidexterity analysis due to the smaller number of studies. The results of contrasts (exploration versus exploitation) indicate that exploration capability ( $\beta = -.028$ ,  $t\text{-value} = -.62$ ) in general has a lower impact on firm performance than exploitation. Thus, H3 was supported but not significant. Similarly, we found that in general ambidexterity has a lower impact on performance than exploitation ( $\beta = -.16$ ,  $t\text{-value} = -1.54$ ) and exploration. Thus, H4 and H5 were supported but not significant. In evaluating other study characteristics, the organizational learning to performance effect sizes are higher for proxy measures of performance than for survey measures ( $\beta = .012$ ,  $t\text{-value} = .23$ ) and the analysis suggests that effect sizes are significantly stronger for subjective data used to measure exploration and exploitation than for objective data ( $\beta = .15$ ,  $t\text{-value} = 2.05$ ,  $p < .05$ ). The SBU characteristic suggests that effect sizes

are stronger for SBU than multiple business unit firms ( $\beta = .059$ ,  $t$ -value = .72) and that the SBU impact on ambidexterity is stronger but not significant ( $\beta = .036$ ,  $t$ -value = .25).

TABLE 1-2: PERFORMANCE, FULL MODEL

	Hypothesis	d.f.	$\beta$ (t-Value)
<b>Predictor</b>			
Exploration	H3	41	-.028 (-.62)
Ambidexterity	H4,H5	41	-.16(-1.54)
<b>Sample Characteristic</b>			
Proxy (1) versus survey data (0) (U1)		41	.012 (.23)
Subjective (1) versus objective data (0) (U2)		41	.015 (2.05)*
SBU (1) versus multiple BU data (0) (U3)		45	.059 (.72)
SBU - Ambidexterity interaction (U4)		41	.036 (.25)

\*Significant at  $p < .05$ .

The findings in the full model led to a robustness check for the best model fit with which to analyze the data while maintaining an a priori perspective. This check evaluated possible models for the best fit by analyzing the model deviance and parameter estimates. A more parsimonious model evaluating the exploitation, exploration, and ambidexterity to performance relationship was found to have better fit. This model consisted of reducing the study characteristics to include only SBU and the SBU to ambidexterity interaction and random in both the intercept and SBU slope. The selection of a reduced model followed the procedures outlined by Singer and Willett (2003) for model comparison based on deviance statistics. This model fit better and had smaller deviance ( $-2LLR = 23.8$ , Akaike information criterion = 32.3, and Schwarz's Bayesian criterion = 39.2). The reduction in fit statistics provides strong evidence of

better fit for the parsimonious model (Raftery, 1995). The relevant parameter estimates for the reduced mixed-effects model appear in Table 3.

TABLE 1-3: PERFORMANCE, PARSIMONIOUS MODEL

	Hypothesis	d.f.	$\beta$ (t-Value)
<b>Predictor</b>			
Exploration	H3	41	-.030 (-.79)
Ambidexterity	H4,H5	41	-.35 (-2.99)*
<b>Sample Characteristic</b>			
SBU (1) versus multiple BU data (0) (U3)		45	.053 (.60)
SBU - Ambidexterity interaction (U4)		41	.29 (1.88)**

\*Significant at  $p < .05$ .

\*\* Significant at  $p < .10$ .

The model with the reduction of study characteristics aids in the analysis of ambidexterity and the impact of SBU organization on ambidexterity. The contrast of exploration versus exploitation remains relatively unchanged ( $\beta = .030$ , t-value =  $-0.79$ ). The contrast of ambidexterity was significantly negative ( $\beta = .35$ , t-value =  $-2.99$ ,  $p < .05$ ). The SBU characteristic also remains relatively unchanged, which indicates stronger impact for SBU rather than multiple business unit firms ( $\beta = .053$ , t-value =  $.60$ ). The impact of the SBU and ambidexterity interaction is positive and moderately significant ( $\beta = .29$ , t-value =  $1.88$ ,  $p < .10$ ). The results from the parsimonious model indicate ambidexterity contributes significantly less to performance than exploitation.

## 5. DISCUSSION AND CONCLUSION

The meta-analysis results reported in this study provides a quantitative summary of bivariate relationships involved in organizational learning in order to better understand the research in this substantial literature stream. This study was also designed to synthesize and analyze the empirical findings on the relationships between different organizational learning processes on firm performance. The regression analysis using a mixed effects model provides further analysis of these performance relationships and other of study characteristics. This section will address the results of the mixed effects model for the environmental and organizational antecedents, relationship between exploration and exploitation, and performance consequences.

The analysis of the environmental antecedents of exploration and exploitation reveals that when firms operate in environments high in technology turbulence firms may need to focus on exploration efforts (.18,  $p < .05$ ) as opposed to exploitation. Technology turbulence indicates the rate of technological change and advancement within the industry. Firms may need to explore new technologies or new applications of existing technologies to serve new customers or new markets. This exploration may be necessary to remain competitive or even survive. These conditions of rapidly changing technological environments make refining existing processes less attractive. A possible explanation is consistent with previous findings in that current capabilities have a positive impact upon performance but in turbulent times the demand for technology-

related capabilities is based upon the need to develop new knowledge rather than using current knowledge to imitate (Song, Droge, Hanvanich, & Calantone, 2005).

Another interesting finding, environmental dynamism may require firms to exploit (.25,  $p < .05$ ) or explore (.31,  $p < .05$ ) their knowledge base. The measure of environmental dynamism concerns a macro view and refers to shifts or changes in either customer, competitor, or technology (Jaworski & Kohli, 1993). A change in any one of these sectors or combination of sectors could require a different firm response. There are differences in dynamic environments which may vary by type and magnitude of the respective sector driving the change. Conditions of high market turbulence may also require firms to exploit (.06,  $p < .05$ ) or explore (.05,  $p < .05$ ). Market turbulence may indicate a change in the composition of customers or the presence of new customers which could produce differentiating preferences, thus demanding new products or services. Addressing these new preferences may be contingent upon the composition of customers and preferences which could mandate the exploration of new products or exploitation to refined existing products in order to meet the changing consumer needs (Hanvanich, Sivakumar, & M. Hult, 2006).

In highly competitive intense environments firms may reap more performance benefits by focusing their resources and efforts on exploiting (.11,  $p < .05$ ) their abilities to better serve their current markets. When the environment is stable firms may focus on either exploration or exploitation depending upon product life cycles and other market conditions. Under conditions of intense competition the risk of exploration may be exacerbated making exploitation a better more viable option. Mizik and Jacobson (2003) stress the need for strategic emphasis on value appropriation in order to maximize returns from firm investments before the profits are claimed

by the competition. Value appropriation exploits current markets and customers to produce the full benefits of firm innovation.

The relationship between exploration and exploitation processes is positive and significant (.24,  $p < .05$ ). This finding provides support for the constructs being separate constructs that do not lie on a continuum but instead are independent but constrained, support for H2. Previous research has indicated that in order for exploration to be successful that a certain level of exploitation must exist. In addition, relationships between a firm's brand and customer capabilities are contingent upon levels of exploration and exploitation. (Atuahene-Gima, 2005; Vorhies, Orr, & Bush, 2010). The success of exploration may depend upon the exploitation of other functions and processes within the organization such as marketing, production, or delivery.

Overall, this analysis reveals that the organizational learning processes are positively associated with performance over a wide range of research contexts. The bivariate analysis indicates the mean impact of each learning process, exploration (.19,  $p < .05$ ) and exploitation (.22,  $p < .05$ ), on performance. They are both positive and significant, indicating that each process contributes to the success of the firm with exploitation having a stronger correlation to performance. The ambidexterity argument is also supported finding a positive mean impact to performance (.13,  $p < .05$ ), although less than either exploration or exploitation. The magnitudes of the mean effects of the organizational learning processes provide support for H3, H4, and H5; additional evidence and support is provided by the regression analysis.

An examination of the variance in these relationships using the full HLM mixed-effects model supports the relative performance impact of exploration, exploitation, and ambidextrous displayed in the bivariate analysis. The contrasts indicate that exploitation has a stronger impact on firm performance than either exploration ( $\beta = -.028$ ,  $t\text{-value} = -.62$ ) or ambidexterity ( $\beta = -$

.16, t-value =  $-1.54$ ). The results of the bivariate and HLM analysis provide support for H3, H4, and H5.

### ***5.1 Managerial Implications***

The results of this study offer guidelines to assist managers in performance impacting practices. For example, when strategic goals dictate the need for exploration or exploitation managers should hold fast to either process through dynamic environmental periods because both have the potential for positive performance impact. Environmental dynamism deals with change that is difficult to predict therefore during these periods management should seek to better understand the dynamics in play because volatility could be rooted in customer preferences, new technologies, or changes in market demand (Dess & Beard, 1984). Managers must resist the tendency to alter strategy solely because they find themselves in dynamic periods. At a time when management is additionally tasked with addressing environmental dynamics, managers must also take on the responsibility of understanding the nature of the dynamics in play. In this assessment, managers should consider rigidities and learning traps that are present in their current environment. Rigidities are current knowledge or capabilities which have worked well in the past but cause resistance to current change (Leonard-Barton, 1992). Learning traps are caused by an organizations focus solely on either exploration or exploitation (Levinthal & March, 1993).

These finding also have interesting implications for managers in periods of technological turbulence. During these periods exploration activities have the potential to produce larger, possibly persistent, performance impacting changes to the firm. Technological turbulence refers to the rate of technological advancement or change within the market place. During times of technological turbulence, rapidly changing technology has the ability to render current

products or competences obsolete therefore driving the need for exploration (Zheng Zhou, Yim, & Tse, 2005). The cause and magnitude of the turbulence is central to managers understanding the current changes in technology. In times of intense competitive pressures managers should ensure focus on exploitation in order to continue to drive performance out of existing products, markets, and customers. Managers should devote the necessary resources to closely monitor the technology development impacting their industry.

Considering strategic managerial orientation, managers should evaluate goals keeping in mind that both exploration and exploitation activities can produce positive performance consequences. Focus on market orientation strategies appears to have a larger impact on exploitation activities than exploration. This may be due in part to the current market focus that market oriented firms generally have. This could manifest in the perspective of market orientation of the firm in that a firm could have either a behavioral (Kohli & Jaworski, 1990) or cultural (Narver & Slater, 1990) perspective. Finally, management should be aware that exploration and exploitation are positively related. This indicates that an organization can focus on high levels of exploration and which does not dictate the exclusion of exploitation activities or high levels of exploitation which does not dictate the exclusion exploration of activities. Managers should align resources with priorities and strategies to each of these learning processes. Managers should also evaluate the levels at which resources are committed to either exploration or exploitation activities at any given point in time as well as evaluating resources needed for planned projects.

## ***5.2 Research Implications and Future Directions***

This study has interesting implications for further theory development in organizational learning. From a theoretical perspective, these findings indicate that exploration and exploitation



are discrete constructs that do not operate on a continuum. The positive relationship between exploration and exploitation indicate an organization is not constrained by the level of one process on the other. The performance gains achieved by one process may depend upon certain levels or emphasis placed on the other. Furthermore, each learning process contributes relatively equally to firm performance. Researchers interested in the relationship to firm performance should enhance the constraints and boundary conditions for achieving persistent performance through organizational learning.

Based on the evidence from this meta-analysis, research has made significant progress toward the understanding of exploration and exploitation. However, despite the progress, there are several gaps in knowledge regarding the conditions which produce the greater firm performance which suggests venues for further research.

*Environmental conditions.* My results suggest that research into the following three topics would help enhance knowledge about the environmental conditions for the organizational learning to performance relationship. This area of research follows Teece, Pisano, and Shuen (1997) as they stress the need for organizations to ‘integrate, build, and reconfigure competencies’ to address dynamic environments. First, environmental dynamism is a multidimensional construct in that the changing nature of the environment can occur in customers, markets, or technology. Further refinement of the nature and level of dynamism could provide additional needed insight into whether firms should explore or exploit. A more robust, fine grained measure of environmental dynamism is needed to determine the dynamics that require an exploration or exploitation focus.

Second, competitive intensity may be dependent on the current status of the organization, for example whether the organization is the current leader or laggard in the market place. In

other words, does the current relative position of the organization impact the strategic decision with which to compete? This distinction could prove beneficial to understanding how organizations should best address the competition. Furthermore, more research is needed to examine the strategic orientation of the firm. An example of this is the classification of a firm as a prospector or defender in order to refine the use of exploration or exploitation (e.g. ,Menguc & Auh, 2008).

Third, further research on technology turbulence may lead to a better understanding of when the selection of exploration or exploitation increases firm performance. The Tu (2010) study begins to explore this relationship but more research is needed. The source of technology turbulence, radical or incremental, may have an impact on the selection of exploitation or exploration in that large shifts in paradigm may require exploration while a smaller incremental change may require exploitation of current knowledge. The rate of turbulence may also hold some insight into the organizational learning to performance relationship.

*Levels of the learning processes.* There has been attention given to the balancing of the levels of each learning process in recent research which has given rise to the concept of ambidexterity. While this research does not address the levels of either process or the combined impact this is also an area where additional research is needed. The concept of ambidexterity may be better served with the evaluation of the individual levels of each learning process. Finite resource theory posits that organizations cannot do everything at the same time due to resource limitations. This constraint is supported by organizational learning theory. Refinements are needed in the measurement of ambidexterity and or the levels of exploration and exploitation to address this research stream going forward.

*Path dependencies.* There has been research in the areas of environmental and organizational antecedents to organizational learning but there is little research which addresses the path dependencies which led the organization to the current situation. Researchers should focus not only on past performance but how this past performance was achieved and under what conditions. This focus may also enhance our knowledge of core rigidities and competence traps.

*Temporal nature of balance.* Organizational learning theory posits that organizations must shift emphasis between exploration and exploitation because of required trade-offs and resource constraints that prohibit the pursuit of both simultaneously. This would lead researchers to either try to disprove this assumption via the ambidexterity argument or discover temporal shifts between each emphasis. There has been recent attention given to the former but not much attention given to the later. Research is needed to discern if organizations shift, over time, their emphasis on exploration to exploitation and vice versa. This approach may be better suited to further examination of factors which may promote a shift.

*Ambidexterity.* Organizational learning theory sets forth the premise that a balance must be achieved between exploration and exploitation. Researchers need to come to a consensus and define ambidexterity very precisely. This is needed because the current literature stream has substantial variation in the construct definition: is it the balance or the simultaneous pursuit? There are also substantial differences on the measurement of ambidexterity. The measurement of the construct has been studied as the interaction, sum, difference, and ratio of scales and various proxies. The definition and measurement of ambidexterity will have implications upon further study and analysis in determining whether ambidexterity is a new construct requiring new measure or an interaction of the measures of exploitation and exploration.

### ***5.3 Limitations***

This study may suffer from several limitations that are common to other meta-analyses. One, I could not include all available studies in the meta-analysis because the focus was limited to studies that examined learning at the firm level. Two, in selecting study characteristics that influence the learning process to performance relationship; we were constrained to variables that could be coded from the information provided in the studies and only antecedents studied frequently in the literature. Three, because the number of studies for some relationships in the bivariate study were small, caution should be used about drawing unwarranted conclusions. Furthermore, it is not feasible in the context of this study to determine whether the dynamic nature of organizational learning affects the relative association of different processes with performance. For example, periods of exploration may be followed by periods of exploitation, or vice versa, in which the relationship between the processes might be relatively more important for performance than the fact that the organization is currently engaged in one or the other. Finally, as in most meta-analyses, the effect sizes must be evaluated and interpreted with care.

### ***5.4 Conclusion***

In conclusion, this research has provided insight through the consolidation of previous empirical research into the organizational learning processes. These findings support organizational learning theory and strengthen the premise that exploration and exploitation have a positive impact on firm performance. In addition, these findings show that exploration and exploitation are positively related to one another.

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## APPENDIX

TABLE 1-4: SAMPLE OF STUDIES IDENTIFIED

<b>Authors</b>	<b>Date</b>	<b>Summary</b>
Yamakawaa, Yang, & Lin	2011	A study of 95 firms in five industries over eight years used RBV to study exploration and exploitation (IVs) as a ratio of alliances to examine the moderating effects of firm characteristics, strategic orientation, and industry environment on firm performance.
Belderbos, Faems, Leten, & Van Looy	2010	A study of 168 R&D intensive firms in Japan, US, Europe in five industries used OL theory to study exploration and exploitation (IVs) in topology of share to measure effects on financial performance.
Brion, Mothe, & Sabatier	2010	A study of 108 large innovative French firms used Org theory to study exploration and exploitation (DVs and moderators) in order to examine the impact of short term focus (formalization and performance oriented management) and long term focus (creativity and risk taking) on innovation ambidexterity moderated by competence exploration and competence exploitation.
Hoang & Rothaermel	2010	A study of 412 R&D projects in large pharma companies used dynamic capabilities theory to study exploration and exploitation (IVs) as internal (product sales) and external (licensing and agreements) exploitation and internal (R&D invests) and external (alliances) exploration to measure (DVs) project performance.
Hughes, Martin, Morgan, Robson	2010	A study of 1311 Mexican high technology international new ventures used RBV & capabilities theory with strategy to study exploration and exploitation (mediators) as innovation ambidexterity (added not multiplied) measured as explorative and exploitative innovation strategy to assess the impact of strategy (cost v differentiation) on export venture performance.
Kollmann & Stockmann	2010	A study of 75 German companies used EO and OL theory to study exploration and exploitation (DVs) individually and ambidexterity to study the impact of entrepreneurial orientation on ambidexterity.
Molina-Castillo, Jimenez-Jimenez, Munuera-Aleman	2010	A study of 1403 innovative Spanish firms used dynamic capabilities and RBV to study exploration and exploitation(IVs) to measure the impact on (DVs) speed to market and market performance with competitive intensity and market turbulence as moderators
Mudambi & Swift	2010	A study of 10, 996 firm years of US publicly traded firms with sales over \$50 million over 10 years (97-06) used R&D investments to study exploration and exploitation (IVs) as shifting between exploration and exploitation measured as R&D volatility in order to determine the impact on firm growth.

<b>Authors</b>	<b>Date</b>	<b>Summary</b>
Piao	2010	A study of 64 firms in the hard-disk industry over 20 years (80-99) used OL theory and Exploration (IV) to determine the temporal effect on longevity of the firm.
Russo & Vurro	2010	A study of 153 companies in global fuel cell industry over eight years used OL theory to study exploration and exploitation (IVs) as internal (citations) and external (alliances) exploitation and internal (unused citations) and external (alliances) exploration to measure (DVs) innovation performance.
Sarkees, Hulland, Prescott	2010	A study of 135 US firms in the manufacturing and services industries used OL theory (ambidexterity) to study exploration and exploitation as ambidexterity (multiplied averages) to explore the mediating impact of marketing function implementation on firm performance.
Tu	2010	A study of 305 Taiwanese teams (175 industrial - 130 Consumer) used dynamic capabilities and RBV to study exploration and exploitation (IVs) as new product and marketing creativity (exploit) and internal and external quality (explore) to measure new product performance with quality mediating creativity.
Vorhies, Orr, Bush	2010	A study of 406 US firms in 12 industries used dynamic capabilities and RBV to study exploration and exploitation (mediators) between market knowledge development and customer focused marketing capabilities to measure objective financial performance.
Anand, Mesquita, Vassolo	2009	A study of 19 global pharma firms over 11 years used OL theory and multimarket competition to study exploration and exploitation (moderators) to study examine market entry and exit
Bierly Damanpour Santoro	2009	A study of 180 university research center relationships in the US used absorptive capacity to study exploration and exploitation (DVs) to measure the effects of external learning capabilities and strategic capabilities on external knowledge application (exploration and exploitation).
Burpitt	2009	A study of 91 suppliers to the furniture industry used leadership theory to study exploration and exploitation (moderators) ratio to examine the effect of transactional versus transformation leadership on firm performance.

<b>Authors</b>	<b>Date</b>	<b>Summary</b>
Cao, Gedajlovic, & Zhang	2009	A study of 122 high tech SME Chinese firms used OL Theory to study exploration and exploitation (IVs) and ambidexterity (multiplied) and balanced (difference) to examine the impact of ambidexterity on firm performance.
Chang, Yang, Chen	2009	A study of 229 academic researchers used OL theory to study exploration and exploitation (IVs) and ambidexterity on both structural and contextual and their impact on research commercialization.
Jansen, Tempelaar, Van Den Bosch & Volberda	2009	A study of 230 firms used OL theory to study exploration and exploitation (DVs), only ambidexterity (additive), to examine the impact of structural differentiation using mediators senior management contingency rewards, senior management social integration, cross-functional integration, and connectedness on ambidexterity.
Jansen, Vera, & Crossan	2009	A study of 89 autonomous branches of a large European financial services firm used leadership theory to study exploration and exploitation (DVs) to examine the impact of transformational and transactional leadership moderated by environmental dynamism on exploration and exploitation.
Lambe, Morgan, Sheng & Kutwaroo	2009	A study of 151 strategic alliances in a single UK information, communication, technology firm to study exploration and exploitation (moderators) to examine the effect of formalization, cooperative competence, and complementarily on NP success.
Mom, Van Den Bosch & Volberda	2009	A study of 716 individual managers in 5 large Fortune Global 500 firms used management and OL theory to study exploration and exploitation (DVs), ambidexterity only (multiplicative), to examine the impact of formalization of a manager's task, cross-functional interfaces, and connectedness to other organizational members impact on a managers ambidexterity.
Nemanich & Vera	2009	A study of 71 work teams in a large MNC US firm used Leadership and OL theory to study exploration and exploitation (DVs) ambidexterity(cross-product of items) to explore the role of transformational leadership and the values incorporated in a learning culture in promoting ambidexterity.



<b>Authors</b>	<b>Date</b>	<b>Summary</b>
Rothaermel & Alexandre	2009	A study of 141 US manufacturing firms used OL theory to study exploration and exploitation (IVs) as technology exploration and exploitation to examine the ambidexterity impact moderated by absorptive capacity on firm performance and firm innovativeness.
Uotila, Maula, Keil, & Shaker	2009	A study of 279 manufacturing firms in the S&P 500 over 16 years study exploration and exploitation (IVs) as a ratio to examine the moderating effect of industry technological dynamism on market value.
Zhang, Di Benedetto, Hoenig	2009	A study of 103 wholly owned Chinese MNC subsidiaries in US, Japan, Europe, and South Korea used RBV and OL theory to study exploration and exploitation (IVs) as breakthrough (explore) and incremental (exploit) and platform (both) focus to examine the mediation impact of knowledge utilization on product innovation.
Im & Rai	2008	A study of 238 customers in a US supply chain firm used relationship and OL theory to study exploration and exploitation (IVs & mediators) and ambidexterity(IVs) to examine contextual ambidexterity (multiplicative) and ontological commitment via exploration and exploitation on relationship performance.
Jansen, George, Van Den Bosch & Volberda	2008	A study of 89 autonomous branches of a large European financial services firm used leadership theory and OL theory to study exploration and exploitation (DVs) as ambidexterity (multiplicative) to examine the impact of senior team shared vision , senior team social integration, and senior team contingency rewards moderated by transformational leadership on ambidexterity.
Li, Lin, & Chu	2008	A study of 227 high tech Taiwanese firms used MO and OL theory and strategy to study exploration and exploitation (DVs) as radical and incremental innovation to examine the impact of responsive and proactive market orientation on ambidexterity.
Menguc & Auh	2008	A study of 260 Australian manufacturing firms used RBV to study exploration and exploitation (IVs) and interaction exploration and exploitation (multiplied) to examine the moderating role of market orientation on firm performance
Morgan & Berthon	2008	A study of 160 UK bioscience firms used MO and generative learning to study exploration and exploitation (IVs & mediators) to examine the impact of market orientation and generative learning mediated by exploration and exploitation on business performance.
Quintana-García Benavides-Velasco	2008	A study of 115 US biotechnology firms over 27 years, studied 985 firm years, used technological diversification to study exploration and exploitation (DVs) to examine diversification impact on exploration and exploitation innovation competence and Innovation competence

<b>Authors</b>	<b>Date</b>	<b>Summary</b>
Tiwama	2008	A study of 42 innovation-seeking project alliances examines the impact of strong and weak ties on knowledge integration and their impact on ambidexterity.
Voss & Voss	2008	A study of 152 US nonprofit theaters used multiple theories to study exploration and exploitation (IVs) as innovation learning (explore) orientation and adaptive learning (exploit) orientation to examine their impact moderated by competitive density on firm performance.
Voss, Sirdeshmukh, & Voss	2008	A study of 163 US nonprofit theaters used OL theory and slack to study exploration and exploitation (DVs) to examine how slack resources interact with environmental threat appraisal to influence product exploration and exploitation.
Bierly & Daly	2007	A study of 98 SME manufacturing firms used OL theory (knowledge strategy) to examine exploration and exploitation (IVs) to study the impact of exploration and exploitation moderated by the external environment (industry dynamism, technology, and munificence) on firm performance.
Cegarra-Navarro	2007	A study of 139 SME Spanish Optometry companies used OL theory to study exploration and exploitation examines the relative importance and significance of “the relationship memory” as a bridge between “exploration” and “exploitation” processes and its effects on the creation of “customer capital”.
Greve	2007	A study of 11 Japanese shipbuilders 4061 observations 258 innovations used innovation and OL theory to study exploration and exploitation (moderators) to examine the effect of slack on innovation.
Lin, Yang & Demirkan	2007	A study of alliances in 95 firms in five US industries spanning eight years (88-95) used OL Theory and Network Theory to study exploration and exploitation (IVs) ambidexterity(categorical based on index) only examine the impact of ambidexterity on firm performance empirically and a simulation to examine network contingencies.
McNamara & Baden-Fuller	2007	A study of 178 bio-pharma firms and 1277 R&D announcements used OL theory and signaling theory to study exploration and exploitation (IVs) exploration (patents and preclinical trials) exploitation (phase 1,2,3 an NDA) to examine investor response to signaling and the stages of R&D
Sidhu, Commandeur & Volberda	2007	A study of 240 Dutch metal and electrical engineering firms used behavioral theory exploration and exploitation (as search) and supply-side, demand-side, and spatial exploration to examine exploitation is contingent on the environment.

<b>Authors</b>	<b>Date</b>	<b>Summary</b>
Slater, Hult, Olson	2007	Study of 160 US R&D intensive firms used strategy, Miles and Snow to study exploration and exploitation (IVs) exploration as technological innovation and exploit as cost of differentiation explore performance.
Tokman, Richey, & Marino	2007	A study of 103 Greek SMEs used strategic behavior theory to study exploration and exploitation (moderator), as a percentage, to determine the impact of a exploration and exploitation weighted portfolio on satisfaction of cooperative relationship portfolio.
Yalcinkaya, Calantone, & Griffith	2007	A study of 111 US import firms used dynamic capabilities to study exploration and exploitation (mediators) between technological and marketing resources to impact product innovation and market performance.
Jansen, Van Den Bosch & Volberda	2006	A study of 283 autonomous branches from a large European financial services firm used OL theory and Org theory to study exploration and exploitation (DVs) as innovation to examine the antecedents (centralization, formalization, connectedness) moderated by environmental dynamism and competitiveness on performance.
Lavie & Rosenkopf	2006	A study of 337 US software firms used OL theory to examine exploration and exploitation (DVs) in the domains of function, structure, and attribute to determine the impact of exploration and exploitation in alliance formations over time.
Lubatkin, Simsek, Ling, & Veiga	2006	A study of 139 SMEs in one region of New England used OL theory and behavioral integration us exploration and exploitation (IVs mediator) ambidexterity only (additive), to examine the TMT behavioral integration mediated by ambidexterity impact on firm performance.
Luo & Bhattacharya	2006	A study of 133 firms 2001-2004 used corporate social responsibility to study exploration and exploitation (IVs) to examine corporate ability exploit (product quality) and explore (innovativeness) to examine the impact on customer satisfaction and market value.
Atuahene-Gima	2005	A study of 227 Chinese firms used RBV and marketing theory to study exploration and exploitation (mediators) to examine customer and competitor orientations and incremental and radical innovation performance.
Auh & Menguc	2005	A study of 260 Australian firms used OL Theory to study exploration and exploitation (IVs) to examine the moderating role of competitive intensity on firm performance (effectiveness and efficiency).
Cegarra-Navarro	2005	A study of 139 Spanish Opticians and Optometrist SME companies used strategic alliances to study exploration and exploitation (IVs) to assess the impact on intellectual capital.

<b>Authors</b>	<b>Date</b>	<b>Summary</b>
Fames, Looy, Debackere	2005	A study of 221 Belgian manufacturing firms 1994-1996 used Org theory to study exploration and exploitation (IVs) as interorganizational collaborations to study the impact of exploration and exploitation on effectiveness (product turnover).
Jansen, Van Den Bosch & Volberda	2005	A study of 363 organizational units (BUs) in a large European financial services firm used OL theory to study exploration and exploitation (DVs) ambidexterity (multiplicative) only on the impact of environmental (dynamism, competitiveness) and organizational (decentralize, formal, connectedness) on ambidexterity.
Olson, Slater, & Hult	2005	A study of 228 manufacturing and service firms used Miles and Snow to study exploration and exploitation (IVs) innovation orientation and internal/cost orientation too examine the business strategy type moderation on overall business performance.
Beckman, Haunschild, & Phillips	2004	Two studies of 1470 alliances and 720 interlocks of large service and industrial firms used network and OL theory to study exploration and exploitation (IVs) as broadening (exploration) and reinforcement (exploit) alliances on firm performance.
Gibson & Birkinshaw	2004	A study of 41 BUs in 10 MNCs used OL theory to study exploration and exploitation (IVs mediators), ambidexterity only (multiplicative), to examine the impact of context (performance mgmt, social context) mediated by ambidexterity (alignment and adaptability) on BU Performance.
He & Wong	2004	A study of 206 Malaysian manufacturing firms over 11 years used OL theory to study exploration and exploitation (IVs) as innovation and the interaction exploration and exploitation to study the mediating effects of product and process innovation intensity on sales growth rate.
Kyriakopoulos & Moorman	2004	A Study of 340 Dutch firms in the packaged food industry used OL theory and Strategy to study exploration and exploitation (IVs) to examine the moderating effect of market orientation on NP financial performance in year 1 and year 2.
Rothaermel & Deeds	2004	A study of 325 biotechnology firms that entered 2565 alliances over a 25-year period (73-97) used OL theory to study exploration and exploitation (IVs and mediators) to examine the impact on alliances in NPD.
Nerkar	2003	A study of 33 pharma firms used knowledge creation and OL theory to study exploration and exploitation (IVs) to examine the impact of temporal exploitation and exploitation on technological impact.

<b>Authors</b>	<b>Date</b>	<b>Summary</b>
Katila & Ahuja	2002	A study of 1185 firm years of 124 firms in the global robotics industry in Europe, Japan, and North America used Search theory to study exploration and exploitation (IVs) as levels of search depth (exploit) and search scope (explore) to examine the impact of search on new products.
Park, Chen & Gallagher	2002	A study of 908 firm years of 171 start-up firms in the US semiconductor industry 471 strategic alliances over 11 years (79-89) used alliance theory to study exploration and exploitation (IVs) categorical to examine the relationship between firms growth and strategic alliances moderated by firm resources.
Rust, Moorman, Dickson	2002	A study of 186 business units in Fortune 500 firms from goods and service sectors used strategy (cost and revenue emphasis) and exploration and exploitation (IVs) for dual emphasis examine the OL theory on firm performance.
Rothaermel	2001	A study of 32 large pharmaceutical firms and 899 strategic alliances used alliance and OL theory to study exploration and exploitation (IVs) as strategic alliances to examine the impact of alliances on NPD.
Zahra, Ireland & Hitt	2000	A study of 321 high-technology firms used international expansion and OL theory to study exploration and exploitation (IVs) mediators search depth (exploit) and search breadth (explore) to examine the impact of international expansion on new venture performance.

ESSAY 2

MARKETING EXPLORATION AND EXPLOITATION CAPABILITIES: THE DYNAMICS  
AND STRATEGIC IMPLICATIONS ON FIRM PERFORMANCE, A LONGITUDINAL  
ASSESSMENT

## 1. INTRODUCTION

*"Over the long run, superior performance depends on superior learning."*

Peter Senge (1990b)

Marketers are increasingly being called upon to adapt and address the changes and dynamics in the marketplace. The gap between the demands of customers and markets and the marketing capabilities needed to address the ever changing marketplace is widening. Marketing capabilities can attain the agility and clarity needed to address these changes through learning and building marketing capabilities (Day, 2011). Organizational learning is a foundational cornerstone on which a firm achieves sustained success and is an influence on the actions and direction of the firm. The firm is a collection of individuals through which the organization itself learns in order to meet the needs of the market and address internal and external forces. Organizational learning has been comprised of three components, which are, firms are based on routines, history-dependent, and oriented to achieving targets. Firm behavior is based on routines and depends upon the consequences of past behavior and the relationship of those consequences to current aspirations of achieving performance targets (Levitt & March, 1988). Firms strive to attain specific performance targets based on strategy and the execution of that strategy over time, both in the short-run and long-run. As firms grow and mature, organizational learning may be the primary determinant in attaining and sustaining a competitive advantage. Marketing research has focused on various aspects of organizational learning and recently began to focus on the dichotomization of marketing capabilities along the lines of exploration and exploitation. March

(1991) considered exploration and exploitation as processes employed by firms in search of attaining competitive advantage and meeting their performance targets.

The development of marketing capabilities along the dichotomization of the learning processes of exploration and exploitation provides insight into exercising marketing capabilities to drive efficiencies with the current knowledge base or to instill effectiveness through the attainment of new knowledge. The investment in marketing exploration and exploitation capabilities for organizational improvement is supported by theory because research indicates the integration and institutionalization of knowledge into the organization forms the basis for developing capabilities (Grant, 1996b; Vorhies, Morgan, & Autry, 2009). Furthermore, marketing exploration and exploitation capabilities have an impact upon the performance of the firm (Kyriakopoulos & Moorman, 2004; N. Morgan, 2012; Vorhies, Orr, & Bush, 2010). I build upon these studies by constructing a longitudinal conceptual model for marketing exploration and exploitation capabilities which I use to evaluate the performance relationship. Therefore, the research questions I study are: How do marketing exploration and exploitation capabilities affect firm performance? And, How do environmental factors influence this relationship? I focus on the performance impact over five years to provide a comprehensive view of the relationship between marketing capabilities and performance. The research will address several gaps in the literature.

First, there is a lack of longitudinal marketing research on the implications of marketing exploration and exploitation capabilities on firm performance. This lack of research inhibits our understating of how marketing capabilities contribute to performance through knowledge development, information processing, and capability improvement. There is need to examine the complex simultaneous analysis of exploration and exploitation in the translation of learning into



strategic action and to assess the consequences of those actions, i.e. performance impact on the organization (Atuahene-Gima, 2005). While we know that organizational learning is a key component to achieving competitive advantage (Sinkula, Baker, & Noordewier, 1997) a deeper understanding of the contributions and performance implications is required.

Second, there is a need to study the overall context outside of the limited contexts of innovation, alliances, and new product development. An examination at the organizational level is needed to address whether “an organization that engages exclusively in exploration will ordinarily suffer from the fact that it never gains the returns of its knowledge” and “an organization that engages exclusively in exploitation will ordinarily suffer from obsolescence” (Levinthal & March, 1993, p. 105). While previous limited scope studies contribute to the knowledge base, there is a need for a more robust analysis to understand the firm level strategic decisions of pursuing marketing exploration and exploitation and the salient factors that influence these decisions. This study provides an investigation into the systematic complementarities and primary factors of influence on these capabilities.

Third, there is a need to consolidate the strategic management and marketing literature of limited cross-sectional and simulation studies (e.g., C. Fang, Lee, & Schilling, 2010; Vorhies, Orr, & Bush, 2010), to extend the work of previous research (e.g., Kyriakopoulos & Moorman, 2004; Menguc & Auh, 2008), and to answer the calls to address the causal implications (e.g., Atuahene-Gima, 2005; Jansen, Tempelaar, van den Bosch, & Volberda, 2009). Although the benefits of exploitation and exploration processes have been discussed in the literature, studies examining the empirical link between exploitation and exploration and performance have shown mixed results. Research has shown a positive significant performance impact of balancing exploration and exploitation (Hughes, Martin, Morgan, & Robson, 2010; Sarkees, Hulland, &

Prescott, 2010). Other findings indicate that a balanced approach does not lead to significant performance gains but emphasis on either activity produces results (Slater, Hult, & Olson, 2007; Vorhies, Orr, & Bush, 2010). Rust, Moorman, & Dickson (2002) found that a dual emphasis, with exploitation and exploration being represented as cost and revenue, did not have a significant impact on performance. This research will explore the causal antecedents and performance implications of the dimensions of marketing exploitation and exploration capabilities to provide insights and extend the research stream.

Fourth, there is a need to go beyond and extend previous research that is based on subjective measures with valid objective financial data. The impact of organizational learning processes have been studied as theoretical arguments (e.g., Levinthal & March, 1993; March, 1991), in simulation studies (e.g., C. Fang, Lee, & Schilling, 2010; Rodan, 2005), and empirically (e.g., Kyriakopoulos & Moorman, 2004; Vorhies, Orr, & Bush, 2010). Most empirical research on the performance impact of exploration and exploitation processes utilize perceptive measures in the form of surveys (e.g., Kyriakopoulos & Moorman, 2004; Sarkees, Hulland, & Prescott, 2010; Tu, 2010; Zhang, Di Benedetto, & Hoenig, 2009) while some research combine objective and subjective measures (e.g., Vorhies, Orr, & Bush, 2010; Voss & Voss, 2008). Most of these studies are cross-sectional in nature and although cross-sectional managerial assessments of performance have been used in marketing studies for a long time, these perceptual instruments potentially suffer from documented biases (e.g., Rindfleisch, Malter, Ganesan, & Moorman, 2008). There is a dearth of marketing research that examines the performance impact of organizational learning based capabilities by linking these processes to objective financial measures. This research addresses this deficiency with a longitudinal

assessment of marketing exploration and exploitation capabilities measured with objective financial metrics.

The manner in which learning processes impact the ability of marketing capabilities to contribute to a competitive advantage has implications for marketers and academics. I develop the conceptual model relying on three theoretical perspectives used to examine the link between capabilities and performance: organizational learning theory (March, 1991), the resource-based view (RBV) of the firm (Barney, 1991b), and strategic choice theory (Child, 1972). This research provides needed analysis to address several gaps in the existing marketing literature. Organizational learning is a critical component in understanding market information processing which can be thought of as the information processes that support the organizational marketing efforts to serve and create markets (Sinkula, 1994). Organizational learning theory provides the theoretical basis for examining how organizations can achieve competitive advantage through improving and creating marketing capabilities. The integration of both new and existing market knowledge drives the organizational ability to attain competitive advantage but requires the continual renewal of competitive advantages through innovation and the development of new capabilities in order to sustain the competitive advantage (Grant, 1996a). Marketing capabilities can contribute to superior performance as drivers of market sensing and customer linking abilities (Alexander Krasnikov & Jayachandran, 2008). The fluctuation of the need for the refinement of current marketing capabilities and the creation of new marketing capabilities underscore the importance of the dynamic adaptability required for sustained competitive advantage. Dynamic marketing capabilities are organizational competencies that allow a firm to create new products and react to changes in the marketplace (Teece & Pisano, 1994). Sustaining a competitive advantage is therefore based on the organization's ability and strategic choice to

adapt by learning to improve current market knowledge and learning about new products and markets through marketing exploration and exploitation.

This manuscript will proceed with the following structure. First, I present a literature review and present theoretically arguments. Second, I present a conceptual framework and offer my hypothesis development supported by theoretical and empirical research. Next, I explicate the research methodology and discuss the results. Finally, I conclude by offering a discussion and some possible research limitations, and by identifying future research directions and suggestions to further develop the proposed line of research.

## 2 THEORETICAL FOUNDATIONS

Marketing, through the development of capabilities, can have an impact on firm performance (N. A. Morgan, Slotegraaf, & Vorhies, 2009; Vorhies & Morgan, 2005; Vorhies, Orr, & Bush, 2010). The establishment of marketing capabilities and alignment with strategic focus enable firms to achieve performance goals and may be impacted by other environmental conditions (Kyriakopoulos & Moorman, 2004). Organizational learning theory posits that “adaptive learning” is necessary for the long term survival of the firm and that this learning is comprised of the refinement of existing knowledge and the acquisition of new knowledge about customers, products, and markets (Day, 1994a; Levinthal & March, 1993). Each of these processes requires resources and capabilities; therefore, the theoretical basis of this paper is founded upon the resource-based view theory (RBV) of the firm. This premise is supported by prior research, which has suggested that organizations develop advantageous capabilities in certain areas (Lado, Boyd, & Wright, 1992; Teece & Pisano, 1994) such as marketing.

Barney’s (1991) seminal publication, “Firm Resources and Sustained Competitive Advantage,” on the value of firm resources, explains why some firms outperform others based on their resources by describing the competitive advantage of the outperforming firms. Barney posits that a sustainable competitive advantage may be acquired if the firm has resources that are valuable, rare, inimitable and non-substitutable (VRIN). A central premise of the resource-based view theory is that rival firms compete on the basis of their resources and capabilities (Amit & Schoemaker, 1993; Barney, 1991b; Teece, Pisano, & Shuen, 1997; Wernerfelt, 1984).

Competitors compete not only based on the similarities among their products, but also based on similarities among their resources and capabilities. Two important tenets of RBV theory are that organizations have heterogeneous resources and that these resources are not readily mobile (Barney, 1991a) which makes duplication by others firms difficult

The dynamic capability perspective augments RBV by including the changes needed to capabilities over time to remain competitive. Teece and Pisano (1994) define dynamic capabilities as a subset of competences that allow a firm to create new products and react to changes in the marketplace. These competences are especially needed in today's business environment because of the increased acceleration of radical innovation and other drivers of external and internal change. These capabilities gain efficiencies from current resources through exploitation and in generating new opportunities through exploration (Rosenkopf & Nerkar, 2001). Organizations can gain competitive advantage by making use of tacit, complex, asset-specific, causally ambiguous competences (Hamel & Prahalad, 1989, 1994; Prahalad & Hamel, 1994) such as marketing exploration and exploitation capabilities. Uncertainty and inimitability of these routines used in building core competences strengthens the competitive advantage. The relationship between competitive advantage and organizational learning which shapes the dynamic capabilities is supported by the following citation.

[T]he competitive advantage of firms lies with its managerial and organizational processes, shaped by its (specific) asset position, and the paths available to it. By managerial and organizational processes, we refer to the way things are done in the firm, or what might be referred to as its routines, or patterns of current practice and learning. (Teece, Pisano, & Shuen, 1997)

The development of marketing capabilities in relation to the two learning processes provides an overarching view of information processing in that this dichotomization emphasizes the type of information which is learned to create knowledge. The investment in the development

of marketing exploration and exploitation capabilities provides resources which are translated into performance through creation of a strategic advantage (Grant, 1996b; Vorhies, Morgan, & Autry, 2009). RBV theory and organizational learning theory further define the ability of the organization to adapt and change resources through knowledge to address the dynamic nature of complex environments. The learning processes embodied in marketing exploration and exploitation capabilities when viewed as dynamic capabilities can further explain competitive advantage in complex, high-velocity, and turbulent markets (Eisenhardt & Martin, 2000). The examination of the strategic choice theory premise, that decision makers consider internal and external environmental factors when making a decision, also highlights the impact of the environment. Strategic choice theory posits that decision makers will make a strategic choice considering many external and internal factors. A key distinction from opposing views of the industrial organization framework (Porter, 1985) and contingency theory (Donaldson, 2001) is the manager is proactive in a deliberate and participatory role (Child, 1972). Strategic Choice theory proposes that decision makers have significant capability and, most importantly, power to make strategic decisions and allocate resources (Child, 1977). Taken together these theories promote the thought that marketing capabilities, marketing exploration and exploitation, are dynamic capabilities which enable firms to react to external and internal forces which potentially creates a competitive advantage.

### ***2.1 Organizational Learning***

Organizational learning has been a focus of researchers since Cyert and March (1963) addressed the processes that organizations utilize to learn as a collective as they interact with their environments and Cangelosi and Dill (1965) explored the topic by observing management teams in a simulation setting in order to determine organizational learning processes. Since this

introduction, organizational learning has been the target of researchers because of the wide range of application and sizable impact this topic has on business today. Organizational learning is the product of individual learning and the dissemination of that individual knowledge throughout the organization for the purpose of modifying organizational behaviors (Huber, 1991; Sinkula, 1994). March (1991) extended the research on organizational learning in his seminal publication by dichotomizing organizational learning into two distinct adaptive processes: exploration and exploitation. These processes impact the learning process throughout all of the steps which organizations learn. Marketing literature approaches these steps as knowledge acquisition, information transition, conceptual utilization, instrumental utilization, and evaluation (Moorman, 1995). This conceptualization is similar to the concept of market orientation which defines the steps as the generation of market intelligence, dissemination of this intelligence throughout the organization, and organizational responsiveness to this intelligence (Kohli & Jaworski, 1990). Market orientation is concerned with the information processes where exploration and exploitation capabilities are concerned with the type of information processed. The way that that an organization processes specific types of market information impacts the methods by which organizations learn. "What they know affects how they search, what they pay attention to, and how they interpret what they find" (Sinkula, 1994). Deshpande and Webster (1989, p. 13) perhaps stated the agenda for this research when they said, "it is time to move beyond structural explanations of marketing management, of 'what happens around here,' to an understanding of 'why things happen the way they do.'"

Organizational learning has been identified as a strategic component that can provide an organization with a sustained competitive advantage (Baker & Sinkula, 1999; Dickson, 1992; Hult, 1998; Slater & Narver, 1995). Researchers have even argued that a firm's ability to create



and sustain a competitive advantage is dependent on the single factor of learning processes (Dickson, 1996); furthermore, organizational capacity to learn is a critical factor in the development and maintenance of a competitive advantage (Hamel & Välikangas, 2003). It has even been stated that "the ability to learn faster than your competitors may be the only sustainable competitive advantage" (De Geus, 1988, p. 71). The organizational ability to develop dynamic capabilities provides the basis for competitive advantage through the employment of resources and continual modification of resource usage. This advantage is created by the organizational ability to create flexible strategies to coordinate and redeploy resources (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997).

## ***2.2 Marketing Exploration Capabilities***

Marketing exploration refers to the development of new knowledge about the firm's markets, products, and capabilities. "Exploration includes things captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery, innovation" (March, 1991, p. 71). Knowledge gained through exploration refers to the development of new knowledge that is in addition to what is currently known regarding capabilities, technologies and markets. Marketing exploration processes are targeted at acquiring new knowledge that can be used to serve new markets and therefore bring additional benefits to the organization. "The essence of exploration is experimentation with new alternatives. Its returns are uncertain, distant, and often negative" (March, 1991, p. 85).

*Marketing exploration* (Kyriakopoulos & Moorman, 2004) is defined as dynamic learning capabilities that provide new knowledge by the development of new skills, processes and marketing capabilities to enter new markets or challenge current marketing approaches in existing markets (Levinthal & March, 1993; Vorhies, Orr, & Bush, 2010). Marketing exploration

is generative learning through which knowledge is created to expand marketing capabilities (Senge, 1990a) and is considered a double-loop system (Argyris & Schfn, 1978). Marketing exploration involves investing organizational resources in an effort to acquire entirely new knowledge in the form of skills, processes and marketing capabilities. This process is characterized by experimentation, risk-taking, and innovation (Jansen, Van Den Bosch, & Volberda, 2006).

### ***2.3 Marketing Exploitation Capabilities***

Marketing exploitation refers to the refinement of current knowledge about the firm's existing markets, products, and capabilities. "Exploitation includes such things as refinement, choice, production, efficiency, selection, implementation, execution" (March, 1991, p. 71). Knowledge gained through exploitation refers to the improvement of existing knowledge enhancing what is currently known regarding capabilities, technologies and markets. Marketing exploitation processes are targeted at refining and improving the current knowledge base that can be used to better serve existing markets and therefore bring more benefits to the organization. "The essence of exploitation is the refinement and extension of existing competencies, technologies, and paradigms. Its returns are positive, proximate, and predictable" (March, 1991, p. 85).

*Marketing exploitation* (Kyriakopoulos & Moorman, 2004) is defined as dynamic learning capabilities that refine current skills, processes and marketing capabilities to gain efficiencies and therefore increase the yields from serving current markets or the application of the current marketing mix (Levinthal & March, 1993; Vorhies, Orr, & Bush, 2010). Marketing exploitation is adaptive learning which is a basic form of bounded learning and is based on assumptions about the organization and the organization's environment (Senge, 1990a).

Adaptive learning is considered single-loop learning (Argyris, 1977). Marketing exploitation involves investing organizational resources in an effort to enhance the current knowledge regarding organizational skills, processes and marketing capabilities. This process is characterized by refinement, efficiency, and execution (Ireland & Webb, 2009).

#### ***2.4 Exploration and Exploitation Measurement***

Previous research has used a diverse range of operationalization for exploration and exploitation with the primary measurement instrument being that of a perceptual scale completed by a knowledgeable practitioner. A review of the prominent scales used in extant research can be found in the Appendix. These constructs are extremely broad concepts with extant forms of operationalization: search depth and breadth of technological learning (e.g., Zahra, Ireland, & Hitt, 2000), ambidexterity (e.g., He & Wong, 2004), innovation (e.g., Jansen, Van Den Bosch, & Volberda, 2006), radicalness of innovation (e.g., Bierly & Daly, 2007), exploration and exploitation competencies (e.g., Atuahene-Gima, 2005), marketing exploitation and exploration strategies (e.g., Kyriakopoulos & Moorman, 2004) and marketing capabilities (e.g., Vorhies, Orr, & Bush, 2010). Although there is no widely accepted measure of exploration and exploitation capabilities, existing research provides a sound basis for the verification of our objective financial measurement. Vorhies, Orr, and Bush (2010) base their instruments on prominent marketing research and use the Kyriakopoulos & Moorman (2004) definitions of marketing exploration and exploitation. This instrument was found to be reliable and valid with alphas of .91 for both measures.

#### ***2.5 Marketing Exploration / Exploitation and Performance***

Marketing exploitation and exploration capabilities have the potential to produce varied organizational outcomes. An organization may require both exploration and exploitation

capabilities which are essential for survival and profitability. Returns from exploitation are more certain and less risky whereas returns from exploration are less certain and more distant from the initial investment. Nevertheless, organizations must invest in both the discovery of new knowledge as well as market opportunities and the refinement of knowledge to gain efficiency in current operations and markets in order to secure persistent economic gains (Levinthal & March, 1993; March, 1991).

The performance implications of marketing exploitation and exploration are based on the assumption that there is a tension created by pursuing both simultaneously and that there is a temporal difference in the returns produced. This tension is created by the efforts to pursue both activities, which compete for resources and require organizational trade-offs (Cyert & March, 1992). This endeavor is in effect trying to efficiently managing current markets while simultaneously exploring future markets. Excessive attention on exploration tends to drive out exploitation efforts. This may trigger exploration efforts to cause a failure to pursue exploitation efforts which may undermine the short-term success of the organization. Exploration has the potential to cause a failure trap. A failure trap occurs when an organization needs to explore new opportunities but fails at those efforts. This failure causes more focus on the search for new exploration, which may also fail, and thus causes the need for more exploration. An organization can become trapped in a series of failures. Excessive attention to exploitation tends to drive out exploration efforts which may place the organization's long-term success in jeopardy (Leonard-Barton, 1992; Levinthal & March, 1993). An exclusive focus on exploitation has the potential to cause a success trap. A success trap may occur because the more an organization develops their exploitation capability; the more likely they will pursue this capability creating a success trap (Leonard-Barton, 1992; Levinthal & March, 1993). Organizations become proficient in utilizing

capabilities in which they excel and when organizations exclusively pursue exploitation this may increase the opportunity cost of exploration (Leonard-Barton, 1992; Levinthal & March, 1993; March, 1991).

In addition to the tension between exploration and exploitation capabilities, the performance implication of each capability differs in their temporal nature. Exploration is focused on innovation, risk and experimentation to reach new markets and customers. These outcomes, however, are visible only over the longer-term, presenting difficult challenges for the firm (March, 1991). Exploration is said to be a more risky endeavor and therefore may produce greater returns, but this capability is focused on the long-term because exploration activities tend to take longer to develop than efficiency improvements. Exploration efforts tend to focus on new markets, technologies, and products, therefore take more time to develop and deploy. Exploitation is said to be the refinement of current operations and markets which tends to be incremental efficiency gains which are more focused on the short-term. A strategy that emphasizes exploitation focuses on satisfying the current customer base of a firm (e.g., Benner & Tushman, 2003; Srivastava, Shervani, & Fahey, 1999). The length of time between investments in exploitation capabilities such as sales force productivity improvements, expanded customer service, and process refinement produces benefits in a shorter time frame than exploration activities (March, 1996).

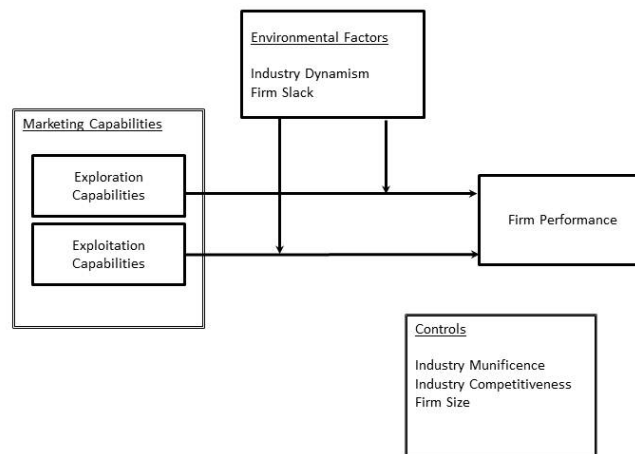
This research seeks to better understand the competitive advantage and performance relationship benefits provided through marketing exploration and exploitation capabilities. This research promotes the perspective of Vorhies, Orr, and Bush (2010) and Kyriakopoulos and Moorman (2004) in the examination of marketing exploration and marketing exploitation. In

examination of the theoretical basis as applied to the primary research questions, the next section will address the application of these theories and development of the research hypotheses.

### 3 THEORY DEVELOPMENT AND HYPOTHESIS

The relationship of marketing exploration and exploitation capabilities on firm performance is the primary focus of this longitudinal research. This research contributes to the literature in addressing two key research questions: (1) How do marketing exploration and exploitation capabilities impact firm performance? (2) How do environmental factors influence this relationship? The conceptual model is presented in Figure 2-2.

FIGURE 2-2: LONGITUDINAL CONCEPTUAL MODEL



Marketing exploration and exploitation are vital to a firm in the attainment of sustained superior performance (March, 1991). Most researchers would agree that the performance

relationship with exploration and exploitation differ in respect to the temporal aspect of returns. Exploration should have a longer-term focus with exploitation having a shorter-term focus. In spite of this general agreement there are few studies that report differential performance effects of exploration and exploitation (e.g., Auh & Menguc, 2005; Ireland & Webb, 2009; Yamakawa, Yang, & Lin, 2011). Previous research findings are inconsistent in their assessment of the exploration and exploitation to performance relationship.

Previous research is also inconsistent as to the optimal balance of marketing exploration and exploitation activities with some research finding emphasis on one or the other activity is best for performance (e.g., Uotila, Maula, Keil, & Zahra, 2009; Vorhies, Orr, & Bush, 2010; Yamakawa, Yang, & Lin, 2011), other research promoting a balance between the two activities (e.g., Atuahene-Gima, 2005; Belderbos, Faems, Leten, & van Looy, 2010; Tu, 2010), and other research advocating emphasizing both activities in an ambidextrous approach (e.g., Hughes, Martin, Morgan, et al., 2010; Jansen, Van Den Bosch, & Volberda, 2005; Sarkees, Hulland, & Prescott, 2010). In evaluating these approaches, we must not lose sight of why firms pursue these activities and that is to enjoy a sustained competitive advantage which produces returns. Strategic marketing theory posits that the firm must employ VRIN capabilities and due to the dynamic nature of the organization and environment, dynamic marketing capabilities contribute to the performance and long-run competitive advantage of the firm (Alexander Krasnikov & Jayachandran, 2008; Vorhies & Morgan, 2005). Therefore, I posit firms that exploration to exploitation will each have a positive impact on firm performance:

*H1: Marketing exploitation capabilities will be positively related to firm performance in the current period.*

*H2: Marketing exploration capabilities will be positively related to firm performance in the next period.*



The dynamic environment in which organizations operate dictates the need for strategic and operational change (Day, 1994b; Levitt & March, 1988). Marketing exploration and exploitation have been found to impact the performance relationship under certain conditions. These factors are not static but change over time and thus require the organization react to these changes to achieve optimal performance and avoid extinction. These environmental and organizational conditions provide the environment for marketing exploration or exploitation activities (Jansen, Van Den Bosch, & Volberda, 2005). There is no consensus among studies as to the nature or effect of the environment on exploration or exploitation. Specific cross-sectional research has found moderation of this relationship based upon competitive intensity (Jansen, Van Den Bosch, & Volberda, 2006; Tokman, Richey, Marina, & Weaver, 2007), stable versus dynamic environments (Bierly & Daly, 2007), market turbulence (Sidhu, Commandeur, & Volberda, 2007), and market perception (Atuahene-Gima, 2005). Exploration may have a greater impact on performance in times of low competitive intensity and low market turbulence (e.g., Molina-Castillo, Jimenez-Jimenez, & Munuera-Aleman, 2011), in low hostility and low competitive intensity (e.g., Tokman, Richey, Marina, et al., 2007). Other studies have indicated that exploration is most effective in periods of high dynamism (Jansen, Van Den Bosch, & Volberda, 2006). Exploitation may have a greater impact on performance in times of market hostility and competitive intensity (e.g., Tokman, Richey, Marina, et al., 2007), still other research indicates exploitation benefits in more stable environments (e.g., Bierly & Daly, 2007). These are all dimensions of a dynamic environment and certain combinations may require a focus on either exploration or exploitation (Hoang & Rothaermel, 2010). The frequency and amplitude attributes of environmental turbulence may determine the amount of exploration is

needed for organizations to adapt (T. Kim & Rhee, 2009). These findings underscore the need for a longitudinal assessment.

“Exogenous environmental change makes adaptation essential, but it also makes learning from experience difficult” (March, 1991, p. 80). Organizational learning theory indicates dynamism has an impact on that adaptive learning processes and causes complications. Dess and Beard (1984) define environmental dynamism as a dynamic and volatile environmental situations that contain drastic discontinuities in demand and growth. In the same spirit, Keats and Hitt (1988) proposed a broader term instability, the definition is similar to the definitions of dynamism in regards to capturing volatility, unpredictability and discontinuities in the dominant industry. Therefore, I posit:

*H3: Environmental dynamism will have a positive moderating effect such that highly dynamic environments will strengthen the relationship between marketing exploitation capabilities and firm performance.*

*H4: Environmental dynamism will have a negative moderating effect such that highly dynamic environments will weaken the relationship between marketing exploration capabilities and firm performance.*

The impact of firm resources on the exploration and exploitation capabilities to performance relationship has also been a focus of researchers. Slack resources are excess resources available to an organization beyond what is necessary for producing the current output from ordinary operations. Slack resources include unabsorbed slack, which corresponds to uncommitted ready-to-deploy assets such as cash funds (Nohria & Gulati, 1996; Voss, Sirdeshmukh, & Voss, 2008). Scholars have opposing views on the impact of slack resources on innovation and, in turn, exploration. Evidence of a positive association is explained as slack facilitates risk taking and innovation by buffering organizations from environmental change and risk which legitimizes experimentation (Greve, 2007). The

opposing view reasons that organizations with slack resources sustain current operations regardless of competitive pressures or market dynamism. Firms meet their performance objectives by consuming current slack resources rather than by innovating (Bourgeois, 1981). Slack resources may both facilitate and moderate exploitation and exploration performance relationship (Nohria & Gulati, 1996).

Organizational slack facilitates exploration and success provides motivation and confidence to experiment (Levitt & March, 1988). Research indicates that slack and performance are associated with exploration more so than exploitation and may be used to overcome firm momentum (Greve, 2007). Organizational slack can come from periods of success and provide resources for exploration activities (Sidhu, Volberda, & Commandeur, 2004). Organizational slack facilitates experimentation which may promote ad hoc innovation by influencing managers to take risks but in many other aspects may have detrimental effects on experimentation (Levitt & March, 1988). Organizational learning theory suggests that slack resources are a necessary but insufficient condition for allocating resources to exploration and that environmental dynamism makes adaptation essential (Cyert & March, 1992; March, 1991). Therefore, I posit that firm slack will moderate the performance relationship such that:

*H5: Financial slack will have a positive moderating effect such that high financial slack will strengthen the relationship between marketing exploration capabilities and firm performance.*

*H6: Financial slack will have a negative moderating effect such that high financial slack will weaken the relationship between marketing exploitation capabilities and firm performance.*

## 4 DATA AND MEASURES

I test the conceptual model in two complementary longitudinal empirical studies. These studies are focused on marketing exploration, marketing exploitation, and firm performance among publicly traded companies. Each study makes use of data collected from a variety of secondary sources, including SDC Platinum, USPTO/Delphion, Trademark Electronic Search System (TESS), and COMPUSTAT. This data includes patent, joint venture and merger, trademark, and spend data in addition the measures of financial performance. The sampling frame included firms that compete in manufacturing and services (Standard Industrial Classification [SIC] that begin with 2001-3999 (manufacturing) and 7001-8999 (services)) during 2003 to 2007. The context of this research is focused on publicly-traded companies in multiple industries. Only firms which report a primary SIC were selected, firm which reported a range of SICs (as indicated by a SIC of xx00) were eliminated from the study. U.S. publicly-traded firms provide consistent measures of financial reporting and other publicly available documents cannot be obtained from many privately-owned firms. The final merged dataset contains 1810 non-missing observations from 362 firms. I summarize the data sources and measures in Table 2-5.

### ***4.1 Measures***

*Firm Performance.* Prior marketing studies (Srinivasan & Hanssens, 2009; Srivastava, Shervani, & Fahey, 1998) have researched marketing's' impact on the firm as a measure of performance. Cash flow has advantages as a measure of financial performance in that it is less

influenced by accrual accounting methods and may be less sensitive to commonly used accounting manipulations (M. Kim & Kross, 2005). The cash flow data is collected from Compustat data item “cash flow from operations” (Gruca & Rego, 2005; Roundtree, Weston, & Geroge, 2008).

TABLE 2-5: CONSTRUCTS, MEASURES, AND SOURCES

**Constructs, Measures, and Sources**

<b>Constructs</b>	<b>Definitions</b>	<b>Measures(Data Sources)</b>
Firm Performance	Performance as a measure of the level of operating cash flow generated by the firm.	Log-transformation of operating cash flow, COMPUSTAT (OANCF)
Firm Growth	Growth as a measure of increase or decrease in overall firm revenue.	Log-transformation of net sales, COMPUSTAT(SALE)
Firm Profitability	Profitability of the firm as a measure of gross margin or sales minus cost of sales	Log-transformation of COMPUSTAT(SALE-COGS)
Marketing General Investment	Marketing spend as captured in partial selling, general & administrative expense	Log-transformation of COMPUSTAT(XSGA-XRD-XAD)
Marketing Advertising Investment	Investment or spend on advertising by the firm	Log-transformation of COMPUSTAT(XAD)
Research and Development Investment	Investment or spend on research and development by the firm	Log-transformation of COMPUSTAT(XRD)
Alliance Investment	Cumulative count of joint ventures, alliances and M&A activity	Log-transformation of JVMA counts, SDC Platinum Database
Patent Investment	Cumulative citation weighted patent calculation	Log-transformation of citation weighted counts, USPTO/Delphion Patent Database
Trademark Investment	Cumulative count of trademarks	Log-transformation of patent counts, Trademark Electronic Search System (TESS) Database
Marketing Exploitation Capabilities	Objective measure of marketing exploitation	Stochastic Frontier estimation
Marketing Exploration Capabilities	Objective measure of marketing exploration	Stochastic Frontier estimation
Survey Exploitation	Subjective measure of marketing exploitation	Four Item measure (executive survey)
Survey Exploration	Subjective measure of marketing exploration	Four Item measure (executive survey)
Industry Dynamism	Intensity of change and environmental turbulence within an industry	The industry sales (logarithm transformed) are regressed in a time series manner (five years). (COMPUSTAT)
Industry Competition	Intensity of competitive rivalry within an industry	Herfindahl index of firm's primary industry sales revenue (COMPUSTAT)
Industry Growth	Rate of sales growth of an industry	The industry sales (logarithm transformed) are regressed in a time series manner (five years). (COMPUSTAT)
Firm Slack	The increase or decrease in retained earnings from the prior year	Log-transformation of current year minus prior year, COMPUSTAT(RE)
Firm Size	Number of people employed by the firm	Log-transformation of number of firm employees (COMPUSTAT)

*Firm Growth.* Gross Sales is used as the measure of firm growth and is defined as the dollar amount of actual billings for regular sales completed during the period, reduced by cash and trade discounts. This construct is used as a proxy for the market outcomes of exploration activities (Rust, Ambler, Carpenter, Kumar, & Srivastava, 2004). The development of new products, markets and customers should increase the overall level of total sales.

*Firm Profitability.* Gross Margin is used as the measure of firm profitability and is defined as net sales minus cost of sales which represents the profit on sales revenue. This construct is used as a proxy for the market outcomes of exploration activities (Rust, Lemon, & Zeithaml, 2004) which is derived from firm investments, such as advertising (Lambin, 1969) . Better serving current markets and customers should increase firm profitability.

*Marketing General Investment.* Selling, general, and administrative (SGA) is an area where these efficient resource investment and improvements should increase firm performance. SGA investment potentially includes expenses that are not strictly marketing but, investments in SGA provide a good proxy for market research, sales effort, trade spend, along with other related expenses. SGA represents expenditures on market research and sales efforts by investing in productivity improvements, customer relationships, and incrementally improving marketing processes (Dutta, Narasimhan, & Rajiv, 1999). Spending efficiently in this area to successfully reach its customer base, increase brand awareness or sales productivity would reflect enhancing this process (Narasimhan, Rajiv, & Dutta, 2006; Srivastava, Shervani, & Fahey, 1998). These actions potentially enhance marketing assets such as to cement the customer relationships that can then become a source of competitive advantage

*Research and Development Investment.* Research and development (R&D) spend is used as a proxy for investing in new innovation as well as integrating and developing marketing

procedures new to the firm. R&D investment enhances a firm's capability in new product development and in the application of new technology and marketing methods. R&D utilizes these investments to produce effective new products and services (Alexander Krasnikov & Jayachandran, 2008).

*Alliance Investment.* A measure of the combined count of joint ventures, mergers, and alliances (JVMA) activity for each period as a measure of externally-oriented exploration. JVMA is used as a proxy for the investment in new markets and product development via acquisition and alliance. These expenditures are investments in new innovation and product development through joint ventures, alliances, mergers and acquisitions (Lee, 2011).

*Patent Investment.* A measure of the cumulative citation weighted patent count which reflects a technological measure of a firm. This measure uses patent counts which represent the number of patents assigned to the firm, weighted by the number of times the patent was cited. This measure is used as a proxy for new product development and creating revolutionary new conceptual approaches (Katila & Ahuja, 2002).

*Trademark Investment.* A measure of the cumulative trademarks filed for and granted by the U.S. Trademark and Patent Office (USTPO). This measure is used as a proxy for enhancing brand awareness and association which results in the creation of brand assets for the current product offering (A. Krasnikov, Jayachandran, & Kumar, 2009; Mizik & Jacobson, 2009).

*Industry Dynamism and Industry Munificence.* Industry dynamism is the extent to which activities, needs, and technology in the market change frequently and reflects the degree of turbulence within an industry. Industry munificence represents growth and supportiveness of an industry. These measures will follow the research of Keats and Hitt (1988). These measures are constructed by assessing the volatility of sales over a five-year period. Five years of industry



sales (logarithm transformed) are regressed against each year in a time series manner and becomes the measure of dynamism and munificence:

$$Y_t = \beta_0 + \beta_1 t + \varepsilon_t, \quad (1)$$

where Y is the logarithm transformed industry sales; t is the year and  $\varepsilon$  is the residual term.

Therefore, the antilog of regression coefficient represents the growth rate which is used as the measure of industry munificence and the antilog of the standard error of the coefficient represents the volatility of sales which is used as the measure of industry dynamism.

*Industry Competition.* A measure of the competitiveness of the industry used to assess the level of competition. This measure also follows Keats and Hitt (1988). This measure is based on the HHI (Herfindahl-Hirschman Index) which is calculate by squaring the market share of each firm and summing the squared values yielding a concentration rate. I then calculate the competition measure using as 1-HHI (E. Fang, Palmatier, & Steenkamp, 2008).

*Firm Slack.* So following Bourgeois (1981), (1988), the modified measure is calculated as the change in retained earnings.

$$\Delta \text{ Slack} = f \Delta (\text{RE}) \quad (2)$$

The extent to which profits are distributed back into the organization as opposed to stockholders and managers, through bonuses, is a source of unabsorbed slack that will be reflected in the balance sheet as changes in retained earnings (RE).

*Firm Size.* This measure is calculated as the log of the number of employees in the firm. This measure follows recent marketing research studies (e.g., Rust & Huang, 2012).

*Survey Exploration and Exploitation.* This survey consisted of the measures developed by Vorhies, Orr, and Bush (2010). Survey Exploitation is measured with 7-point likert scales ranging from much worse than competitors to much better than competitors with items: Please indicate how your business uses market knowledge to make modifications to existing marketing processes, relative to your main competitors; (1) Consistently reexamining information from previous projects and/or studies to modify existing marketing processes; (2) Routinely adapting existing ideas when developing new marketing processes; (3) Incrementally and routinely improving our existing marketing procedures; (4) Focusing changes in marketing procedures on improving efficiency. Survey Exploration is measured on the same scale with items: Please indicate how your business uses market knowledge to change the way it thinks and to create new, or replace, existing marketing processes, relative to your main competitors; (1) Continually developing new marketing procedures that are very different from others developed in the past; (2) Routinely introducing new marketing procedures which are daring, risky, or bold; (3) Consistently using market knowledge to develop new marketing processes which deliver different outputs from existing processes; (4) Using marketing knowledge to “break the mold” and create new marketing processes not used before.

## 5 STUDY 1

### 5.1 Analysis

*Stochastic Frontier Estimation Method.* Marketing exploration and exploitation are conceptualized as the outputs obtained from resource inputs. Stochastic frontier estimation (SFE) is an econometric method that captures this input-output effect by estimating the capability of each firm and then comparing it against competitors (Aigner, Lovell, & Schmidt, 1977). SFE specifically allows for a two-part error term that captures both inefficiency in firm capabilities and inherent randomness, which is better suited for this data set than other econometric methods. An alternative method, data envelopment analysis (DEA) was considered. DEA is a nonparametric technique that calculates a similar measure of efficiency (Charnes, Cooper, & Rhodes, 1978) but is not as robust in measuring randomness derived from events outside of the firm's competitors (Aigner, Lovell, & Schmidt, 1977). Estimates for each year across all firms are estimated following Dutta, Narasimhan, and Rajiv (1999), the SFE model is the maximization of an objective function that takes the following form:

$$Y_{it} = \int (X_{it} \alpha) + \varepsilon_{it} - \eta_{it}, \quad (3)$$

where  $Y_{it}$  is the output for the  $i$ th firm in the  $t$ th time period,  $X_{it}$  is the vector of resource investments, or inputs, and  $\alpha$  is the vector of coefficients for the associated input variables. The two-part error term,  $\varepsilon_{it} - \eta_{it}$ , represents vectors of stochastic error (random shocks outside of management control that influence the variables) and inefficiency error (omitted variables) respectively. The random error component,  $\varepsilon_{it}$ , is assumed to be independent and identically distributed with a mean 0 and variance  $\sigma^2_{\varepsilon} \sim N(0, \sigma^2_{\varepsilon})$ . The inefficiency error component,  $\eta_{it}$ , is

assumed to be non-negative, independent and identically distributed with a mean  $\mu$  and variance  $\sigma^2_\eta \sim N(\mu, \sigma^2_\eta)$  with a half-normal distribution. The error terms are also assumed to be independent of each other as well as of the independent variables.

A maximum likelihood estimate for the exploitation and exploration capabilities for each firm in each period can then be obtained by following the Cobb-Douglas formula set forth by Dutta, Narasimhan, and Rajiv (1999):

$$y = e^{\alpha_0} \left[ \prod_{i=1}^k \prod_{t=1}^k x_{it} \alpha_{it} \right] e^e e^{-\eta} \quad (4)$$

*Marketing Exploitation and Marketing Exploration.* These measures use a series of inputs to efficiently produce an output from the SFE (see Table 2-6). Marketing expenditures have potential to influence marketplace performance (Rust, Ambler, Carpenter, et al., 2004). A firm can increase its exploitation capability by spending in certain areas. Spending on selling, general and administrative (SGA) is one area where these improvements could be seen. SGA represents expenditures on market research and sales efforts by investing in productivity improvements, customer relationships, and incrementally improving marketing processes. Diligent spending in this area to successfully reach its customer base, increase brand awareness or sales productivity would reflect enhancing this process. Advertising is another means of increasing brand awareness and creating a favorable brand image. Finally, the creations of trademarks are viewed as images of product distinction and branding, impact customer perception. Each of these investments should be evident by the increase in firm profitability.

Exploration capabilities, on the other hand, are enhanced by investments in research and development as well as in external affiliations such as joint ventures, alliances, or acquisitions.

Current year research and development expenditures supply the resources for scientists and engineers to continue their work on patents and the creation of new products. These expenditures can also result in developing new marketing procedures which are new to the firm. Firms that are leaders in R&D tend to invest resources to maintain that position (Ofek & Sarvary, 2003). External affiliations, such as entering into new alliances or mergers and acquisitions provide an infusion of knowledge and assets that can positively contribute to exploration capability. This requires up-to-date resources in the form of such things as facilities, knowledge, and personnel. Accounting for these investments provides a more accurate estimation of management practice in exploration capability development. These expenditures should increase total revenues brought into the organization and should be evident from total sales.

TABLE 2-6: SFE OF MARKETING CAPABILITIES

<i>Marketing Exploitation</i>		<i>Marketing Exploration</i>	
Output: ln (GP)	Firm Profitability	ln (SALES)	Firm Growth
Input Variables:		Input Variables:	
ln (pSGA)	Marketing General Investment	ln (R&D)	R&D Investment
ln (XAD)	Advertising Investment	ln (JVMA)	Alliance Investment
ln (TTMARKS)	Trademark Investment	ln (wPAT)	Patent Investment

*Validation of SFE.* As an additional measure of increasing the validity of my measures, a Survey was sent to 354 marketing executives, designated as the Chief Marketing Office or Executive, by the Hoovers database. These 354 executives are from the 362 firms in the following studies. This short survey is described in the measures section of this paper. The survey was sent in three separate mailing waves approximately two weeks apart resulting in 29

responses for a response rate of 10.10% (67 surveys were returned undeliverable). Responses were evaluated for early-late response bias (Armstrong & Overton, 1977) and no evidence was present. The scores for the survey exploration and survey exploitation were summed to represent a subjective measure of each capability. The survey items for marketing exploration were found to have a good positive correlation of .49 with the SFE measures of marketing exploration. The survey items for marketing exploitation were found to have a good positive correlation of .54 with the SFE measures of marketing exploitation.

TABLE 2-7: DESCRIPTIVE STATISTICS AND CORRELATION MATRIX

	<b>M</b>	<b>SD</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>1.</b> Cash Flow	4.672	1.758									
<b>2.</b> Next Cash Flow	4.730	1.807	.79								
<b>3.</b> Year	2005	1.415	-.21	.10							
<b>4.</b> Exploitation Capabilities	0.436	0.191	.16	-.18	-.26						
<b>5.</b> Exploration Capabilities	0.340	0.170	-.13	.06	-.07	.24					
<b>6.</b> Firm Slack	5.952	1.995	.40	.36	.07	-.01	-.07				
<b>7.</b> Competition	0.762	0.181	.08	.05	-.03	-.04	.10	.08			
<b>8.</b> Munificence	1.074	0.116	.06	.10	.28	-.04	-.01	.11	-.11		
<b>9.</b> Dynamism	1.036	0.036	-.12	-.14	-.05	-.03	-.01	-.06	-.24	-.40	
<b>10.</b> Firm Size	0.020	2.107	.55	.56	.04	-.29	-.20	.02	-.05	.01	-.07

*Fixed Effects Model.* To test the hypotheses, I obtained 1810 observations that represent a balanced dataset for 362 firms over 5 years. In Table 2-7, I summarize the descriptive statistics for all measures, pooled across time and all firms. An important advantage found in using the fixed effects model is that all time invariant firm characteristics can be controlled, thus reducing bias (Allison, 2009). The measures were mean centered to assist in the interpretation. The variance inflation factor (VIF) for all variables was below 2.5. The dataset consists of a panel structure in a time series layout with observations for multiple firms. This model requires

attention to some estimation issues. First, the dependent variables, the logarithm of cash flow and next (t+1) cash flow, may be nonstationary. This could potentially bias the estimates (Cameron & Trivedi 2005). However, in this dataset, the panel unit root tests indicate that cash flow ( $z = -20.62, p < .01$ ) and next cash flow  $z = -22.82, p < .01$ ) are stationary. Second, first-order serial correlation may also bias parameter estimates. For my sample, the Wooldridge (2002) test confirms that there is no first-order serial correlation, thus indicating that autocorrelation is not a problem ( $p = .52$ ). Third, I computed the White test statistic ( $\chi^2 = 205.4, p < .01$ ) and Breusch-Pagan statistics ( $\chi^2 = 66.04, p < .01$ ) to test for homoskedasticity, constant variance. Both tests indicate that the variance is not homoskedastic therefore; I conclude heteroskedasticity is a potential issue. To address this issue, I implement the Huber/White/sandwich estimation, a robust estimation, for the variance components which produces cluster-robust Huber/White standard errors. Fourth, I conducted the Hausman (1978) test to determine whether to model the unobserved effects as fixed or random effects. Hausman's test was significant ( $p < .05$ ), confirming the selection of a fixed-effect, cross-sectional, time-series regression model. The specification of this fixed effects model is as follows:

$$\begin{aligned}
 \text{Firm Performance} = & \nu + \alpha_i + \gamma_t + \\
 & \beta_1 \text{Marketing exploitation capabilities} + \\
 & \beta_2 \text{Marketing exploration capabilities} + \\
 & \beta_5 \text{Industry dynamism} + \\
 & \beta_6 \text{Slack} + \\
 & \beta_7 \text{Industry Competition} + \\
 & \beta_8 \text{Industry munificence} + \\
 & \beta_9 \text{Firm Size} + \varepsilon_{it},
 \end{aligned}$$

where  $v$  is the overall constant;  $\alpha_i$  are firm-specific fixed effects;  $\varepsilon_{it}$  = error term, such that  $E(\varepsilon_{it}) = 0$  and  $E(\varepsilon_{it}^2) = \sigma_e$ .

This model includes three control variables: industry competition, industry munificence, and firm size. In study 1, I estimate a main-effects-only model. In the examination of firm performance, I used cash flow from the current year and next year as the dependent variable in the main effects models.

## **5.2 Results**

I report the results of Study 1 in Table 2-8. Model 1 examines the main effects of exploration and exploitation capabilities on current cash flow from operations during the current period. Considering the independent variables are centered, the intercept ( $\beta = 4.80, p < .01$ ) indicates when all variables are at their mean the value cash flow is \$121.41 million. The results indicate marketing exploitation capabilities have a significant positive impact on firm performance ( $\beta = .68, p < .01$ ) in support of H1. However, marketing exploration capabilities have a significant but negative impact on firm performance in the current period ( $\beta = -.06, p < .01$ ). Industry dynamism has a strong negative impact on firm performance ( $\beta = -2.46, p < .05$ ) and firm slack has a positive impact ( $\beta = .13, p < .01$ ). None of the control variables in Model 1 indicate significance.

In Model 2, I modified the dependent variable to the next period cash flow from operations. The intercept ( $\beta = 4.78, p < .01$ ) indicates when all variables are at their mean the value cash flow is \$119.61 million. The results indicate marketing exploration capabilities have a significant positive impact on firm performance ( $\beta = .49, p < .05$ ) in support of H2. Similar to Model 1, industry dynamism has a negative impact on firm performance ( $\beta = -3.24, p < .01$ ) and firm slack has a positive impact ( $\beta = .06, p < .05$ ). Two of the control variables exhibit a



significant relationship: industry competitiveness ( $\beta = -2.25, p < .01$ ) and industry munificence ( $\beta = 1.19, p < .01$ ) on next period cash flow.

TABLE 2-8: RESULTS OF CAPABILITIES AND PERFORMANCE (Study1)

Constructs	Hypotheses	Model 1	Model 2
		Cash Flow	Next Cash Flow
Intercept		4.80(.05)***	4.78(.05)***
<i>Effects of Marketing Capabilities on Firm Performance</i>			
Exploitation Capabilities	H1	.68 (.22)***	-.25(.28)
Exploration Capabilities	H2	-.61(.20)***	.49(.24)**
Industry dynamism		-2.46(1.24)**	-3.24(1.12)***
Firm Slack		.13(.02)***	.06(.03)**
<i>Control Variables</i>			
Industry Competitiveness		.73 (.95)	-2.26(.84)***
Industry growth		-.10(.43)	1.19(.36)***
Firm Age		.13(.18)	.09(.13)
R-squared (between)		.1089	.1288
F-statistic, df (11,361)		13.7***	14.47**

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

I report unstandardized coefficients with White robust standard errors in parentheses

## 6 STUDY 2

### 6.1 Analysis

*Fixed Effects Model.* Study 2 uses the same dataset as the previous study in the examination of the moderating effects of industry dynamism and firm slack. The dataset consists of a panel structure in a time series layout with observations for multiple firms. I include the simple main effects of the moderators for proper interpretation. The specification of this fixed effects model is as follows:

$$\begin{aligned} \text{Firm Performance} = & \nu + \alpha_i + \gamma_t + \\ & \beta_1 \text{Marketing exploitation capabilities} + \\ & \beta_2 \text{Marketing exploration capabilities} + \\ & \beta_3 \text{Marketing exploitation capabilities} \times \text{Industry dynamism} + \\ & \beta_4 \text{Marketing exploration capabilities} \times \text{Industry dynamism} + \\ & \beta_5 \text{Marketing exploitation capabilities} \times \text{Firm Slack} + \\ & \beta_6 \text{Marketing exploration capabilities} \times \text{Firm Slack} + \\ & \beta_7 \text{Marketing exploration capabilities} + \\ & \beta_8 \text{Slack} + \\ & \beta_7 \text{Industry Competition} + \\ & \beta_9 \text{Industry dynamism} + \\ & \beta_{10} \text{Industry munificence} + \\ & \beta_{11} \text{FirmSize} + \varepsilon_{it}, \end{aligned}$$

where  $\nu$  is the overall constant;  $\alpha_i$  are firm-specific fixed effects;  $\varepsilon_{it}$  = error term, such that  $E(\varepsilon_{it}) = 0$  and  $E(\varepsilon_{it}^2) = \sigma_e$ . This model also includes three control variables: industry competition, industry munificence, and firm size, as well as the effects of the moderators.

## **6.2 Results**

I report the results of Study 2 in Table 2-9. Model 1 examines the moderating impact of industry dynamism and firm slack on current period firm performance. The results indicate the interaction with marketing exploration capabilities has a significant positive impact on firm performance ( $\beta = 7.75$ ,  $p < .05$ ) and the interaction with marketing exploitation capabilities has a significant positive impact on firm performance ( $\beta = 8.30$ ,  $p < .05$ ) supporting H3 but not H4. Neither interaction with firm slack indicates a significant relationship, thus no support for H5 or H6.

TABLE 2-9: RESULTS OF CAPABILITIES AND PERFORMANCE (Study2)

Constructs	Hypotheses	Model 1 Cash Flow
Intercept		4.80(.05)***
<i>Effects of Marketing Capabilities on Firm Performance</i>		
Exploitation Capabilities		.71 (.23)***
Exploration Capabilities		-.62(.20)**
<i>Moderating Effects</i>		
Exploitation * Industry dynamism	H3	7.74(3.88)**
Exploration * Industry dynamism	H4	8.30(3.63)**
Exploitation * Firm Slack	H5	.04(.08)
Exploration * Firm Slack	H6	-.04(.08)
Industry dynamism		-2.45(1.24)**
Firm Slack		.13(.02)***
<i>Control Variables</i>		
Industry Competitiveness		.65 (.98)
Industry growth		-.05(.40)
Firm Age		.12(.12)
R-squared (between)		.1159
F-statistic, df (15,361)		12.34***

\*p<.10, \*\*p<.05, \*\*\*p<.01.

I report unstandardized coefficients with White robust standard errors in parentheses

## 7. DISCUSSION AND CONCLUSION

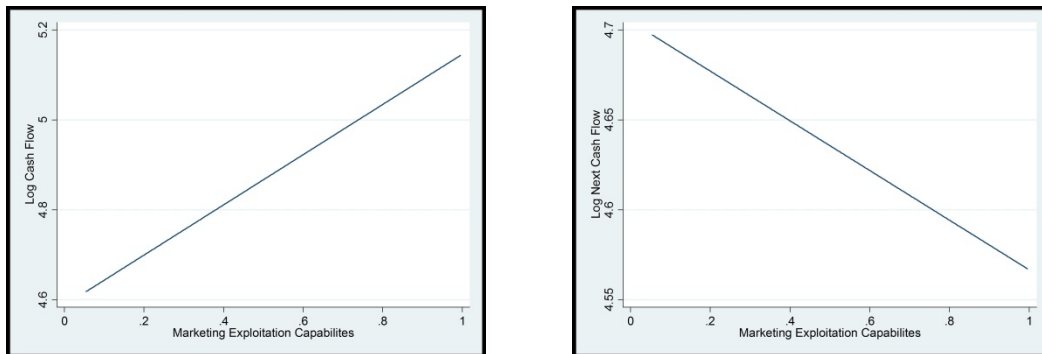
### *7.1 Discussion*

The need of the firm and value to the firm of developing new products, markets, and customers is known to practitioners as well as the importance and value of better serving current markets. RBV and dynamic capabilities theories support the importance of marketing capabilities' contribution to firm performance. Extant research supports a positive relationship between performance and marketing capabilities. In addition, strategic choice theory supports the impact of environmental factors in determining a strategic direction. However, very little empirical research has longitudinally evaluated how marketing exploration and exploitation capabilities impact performance or how this relationship is moderated by environmental factors over time. Environmental factors influence the relationship between marketing capabilities and firm performance. There is also a lack of longitudinal empirical research on the performance implications of these capabilities or on the environmental conditions in which marketing capabilities contribute to firm performance. This research focuses on the impact of marketing capabilities of exploration and exploitation on firm performance by examining the magnitude, direction, and temporal aspect of returns, thereby increasing the understanding of how each capability contributes to the bottom line. In addition, this research examines the moderating impact of industry dynamism and firm slack on each capability in order to better understand the environment in which each capability contributes to firm performance. I test the effects of marketing capabilities in two studies. The first study develops the exploration and exploitation

capability measures, validates them against a cross-sectional survey, and then examines the effect of each capability on current and next period firm financials. The second study extends the capability to performances relationship in the examination of the moderating influence of environmental conditions.

The results, in Table 2-8, show that marketing exploitation capabilities can be a driving force for short-term financial performance. The effects of exploitation capabilities have a positive impact on firm performance during the current period. This relationship indicates that firms can expect returns from exploitation investments in the relative near term. This may be due to the nature of exploitation activities such as advertising and sales. Advertising builds brand awareness and potentially brand loyalty but the effects of an advertising campaign is to place the product or service in memory to be accessed during the next consumption activity. Investments in selling expenditures can also influence the current purchase cycle facilitating a shorter return on investment. Marketing exploitation capabilities generate positive cash flows for the firm in the period in which they are engaged. Figure 2-3 display the impact of exploration capabilities on firm performance for the current period cash flow and the next period cash flow.

FIGURE 2-3: EFFECT OF EXPLOITATION ON FIRM PERFORMANCE

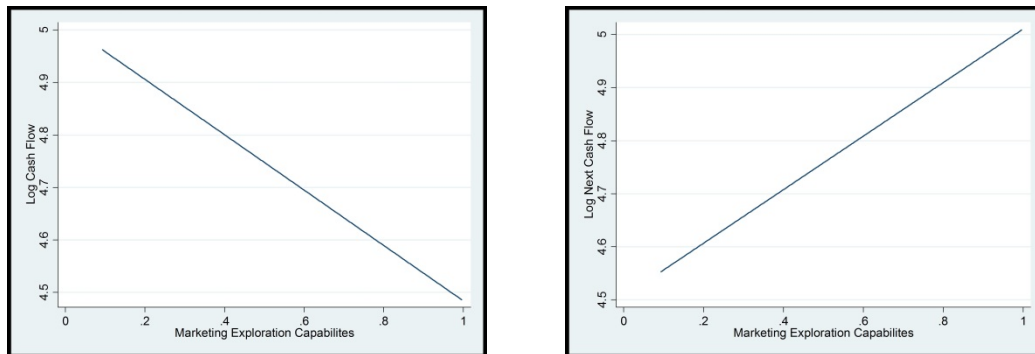


Marketing exploration capabilities, unlike exploitation capabilities, do not produce immediate positive performance results (see Figure 2-4). This is consistent with the Kyriakopoulos and Moorman (2004) research in finding a negative relationship between exploration and performance in year one. Investments in exploration capabilities are more substantial in scope and risky in nature which may be a factor in the time needed in order to produce results. In many industries, R&D activities may take a substantial amount of time to come to fruition. The development cycle for patents can also take a considerable amount of time. In some industries, for example the pharmaceutical industry, this process can take several years. Marketing exploration capabilities require time to produce returns and have a negative impact on firm cash flows in the current period.

An interesting finding is that impact of exploration and exploitation activities on performance are opposite for the next year period financial performance (see Figures 2-3 and 2-4). Exploitation capabilities do not produce future financial performance. The opposite is true for exploration capabilities in that the investment in these capabilities produce significant and positive firm performances in the future. This differs from the Kyriakopoulos and Moorman (2004) research which found a negative relationship between exploration and performance in year two. This may be due to the difference in studying a five year period versus a two year period. The delayed effect from exploration activities may be due to their inherent nature; but the negative impact from exploitation capabilities is not so obvious. Since this study measures exploitation capabilities as the efficiency of which profits are generated through advertising, selling, and trademarks, the knowledge gained in the current period may not always translate to efficiencies in the next period. This finding also differs from the Kyriakopoulos and Moorman (2004) research which found a positive relationship between exploitation and performance in

year two. These differences must also consider the five year period covered by this research. The performance gains generated through exploitation capabilities do not carry over but need to be repeated in the next period possibly due to external forces such as industry dynamism.

FIGURE 2-4: EFFECT OF EXPLORATION ON FIRM PERFORMANCE

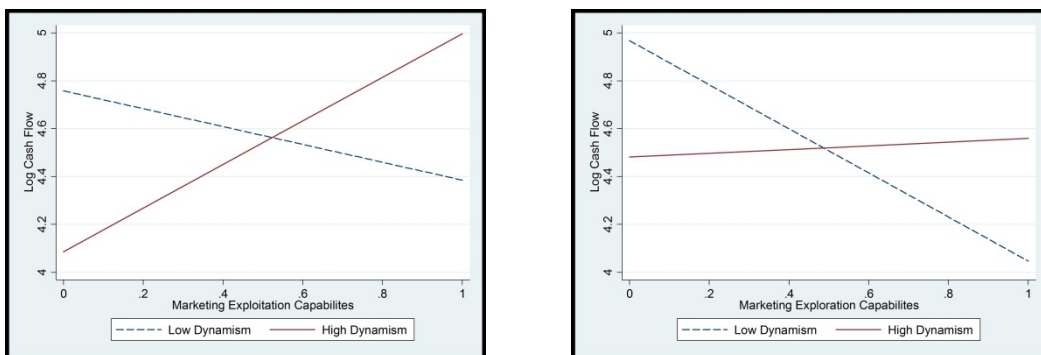


Study 2 was performed to investigate the moderating impact of industry dynamism and firm slack on marketing exploitation and exploration capabilities. Dynamism is defined as a volatile and changing environment and is measured in this study as volatility of sales in the industry(Keats & Hitt, 1988). The charts in Figure 2-5 were created by the creation of high and low levels of industry dynamism. The low level was created as one standard deviation below the mean and the high level was one standard deviation above the mean (e.g., Homburg, Artz, & Wieseke, 2012; Puligadda, Ross, & Grewal, 2012). In examining the main effects, industry dynamism has a large, significant negative impact on firm performance. This is a common understanding among practitioners and researchers, but finding moderating factors which allow firms to have positive performance gains in periods of dynamism is of interest.



Under conditions of high dynamism both exploration and exploitation capabilities have a positive impact on firm performance (see Figure 2-5). The negative impact of marketing exploration on performance, displayed in the main effects model, is mitigated in highly dynamic environments. A possible explanation of this finding is when firms are in highly dynamic environments exploration capabilities become more of a normal method of operating. In order to be successful in dynamic times, firms must continually learn and adapt to the new conditions to keep from being left in the dust of their competition. The positive performance impact of exploration capabilities in highly dynamic environments is quite different than the main effects for exploration capabilities. When firms are endeavoring to compete in dynamic environments through exploitation a positive relationship still exists for the efficiencies gain through exploitation. A possible explanation is that in dynamic environments doing things right is just as crucial as doing the right things. This finding may help to explain the finding of Vorhies, Orr, and Bush (2010) when they found that each capability may be dependent upon certain levels of the other. It is possible, there are additional moderators at work or that inertia causes firms that are employing exploitation or exploration capabilities as a primary strategy method during more stable periods carries over into dynamic periods. Firm slack displayed no interaction with either marketing exploration or exploitation on current period cash flow.

FIGURE 2-5: MODERATING EFFECT OF DYNAMISM ON FIRM PERFORMANCE



When considered together the overall findings of study 1 and study 2 support the thought that each capability positively and negatively impacts firm performance. There are periods influenced by internal and external factors which make the pursuit of each capability more attractive. The following sections discuss the results and implications, both theoretical and managerial, from each study.

### ***7.2 Theoretical Implications***

This research has implications for marketing theory in three primary areas. First, this research provides theoretical implications for the application of RBV and strategic choice theory to marketing capabilities. Identifying and timing the application of these capabilities offers insight into the pursuit of sustainable competitive advantage (Barney, 1991a) and strategic decision or choice of management (Child, 1972). Dividing marketing capabilities on the basis of exploration and exploitation provides additional understanding of how resources become VRIN through the appropriate application of these resources in the environment. Thus, the focus on either capability may shape the competitive advantage under certain situations and prolong the duration over which the advantage is realized.

Second, these findings extend and complement previous research on marketing exploration and exploitation. This study establishes a valid objective representation of marketing exploration and exploitation. These findings are consistent in part with the Kyriakopoulos & Moorman (2004) study in that exploitation produces positive and exploration produces negative performance results in the current period. The results from the 2004 study indicate the performance results from exploitation will remain positive and the results from exploration will remain negative in the next period. This research sample is broader in the range of industries

included and covers a longer five year period than the sample in the 2004 study. This research also extends previous work on the moderation of industry dynamism on the capability to performance relationship (e.g., Uotila, Maula, Keil, et al., 2009). In addition, these findings support dynamic capability theory through the moderation of dynamic environments on marketing capabilities.

Third, these results support the organizational theory premise that successful exploration and exploitation efforts produce positive results. Additionally, this research finds that each of these activities can also have negative implications, especially, when not properly matched to internal and external environmental factors. Exploration and exploitation may be constrained not only by limited, finite, resources but also by the conditions which influence a positive and negative influence. The gains provided by exploitation capabilities appear to be consumed by exploration capabilities. The simultaneous pursuit of both capabilities may offset the gains provide by the other both in the near term and the long term. The application of each capability may be dependent upon the profits provided by the other.

### ***7.3 Managerial Implications***

The findings of this research also have useful implications for management. First, performance appears to be impacted by exploration and exploitation in a competing manner. Exploration may provide benefits, in the near term, which may be consumed by exploration activities in order to produce future performance. This may assist managers in avoiding success and failure traps through future direction and planning. Managers must be astute to division of resources and benefits derived. This has planning ramifications especially in the timing of when to deploy each capability based on current and forecasted environmental conditions. This further

underscores the importance of achieving a planned balance of exploration and exploitation capabilities.

Marketing exploitation capabilities provide performance gains for the current period of operation, but these capabilities must be continually engaged in driving efficiency gains because the effects do not impact the next period performance. Management must continually be attentive to exploitation capabilities in that the positive impact may not carry over. As an example, if management launches a successful advertising campaign in the current period which generates profitability, management must not expect continued profit generation. The capability developed in efficiently generating advertising returns should be developed and reengaged in future periods. The performance gains from marketing exploitation capabilities, such as advertising in this example, must be re-applied in order to produce profitability in the future.

This research provides evidence that exploration and exploitation capabilities each provide performance improvement. In dynamic environments, managers may select either of the capabilities because each capability can provide benefit in the production of cash flow. This research suggests that in dynamic environments engaging both exploration and exploitation capabilities at high levels may produce the best performance gains. This interpretation must be evaluated with care because this research did not look at the synergistic impact of both capabilities simultaneously being at high levels. An ambidextrous approach requires that managers continually build and develop each capability and must consider that building capabilities takes time and resources.

#### ***7.4 Limitations and Future Directions***

The use of secondary longitudinal data on U.S. public firms over a wide range of industries has some limitations. The use of this information, by definition, excludes privately

held firms. The availability and completeness of information is limited to the granularity of accounting and disclosure. The financial marketing data available is constrained to SG&A with advertising and R&D reporting available to only firms that report these figures. Furthermore, each of these expenditures reflect the total spend in the respective category in aggregate. Further granularity could provide additional insight through the disaggregation of these amounts; but this data is not available. The influence of moderators is also limited in scope due to their availability and application across diverse industries. Although the independent capability measures have been validated using theoretically precise subjective measures, these measures are applied at the firm level and may have variation within products and markets which are served by the firm.

This research examines the marketing function in the classification of capabilities by exploration and exploitation. Marketing theory may be enhanced with future research which expands this model to further divide marketing capabilities by functional area (Vorhies & Morgan, 2005) or integration and deployment (Vorhies, Morgan, & Autry, 2009) as exploration and exploitation capabilities.

Further research which focuses on the expansion of moderating factors could be useful in the examination of the capability to performance relationship. Further research could identify and expand the important moderators in this relationship, for example, by gathering information through expert interviews. Additional research using in-depth interviews, surveys, and field studies could further refine the temporal nature of how marketing exploration and exploitation capabilities contribute to firm performance.

Finally, marketing exploration capabilities produce performance improvement in the future. Additional research into the length of time it takes to produce the performance

improvement and the duration which the improvement is enjoyed could provide useful managerial insight for planning and strategy.

### ***7.5 Conclusions***

In conclusion, capabilities in exploration and exploitation drive firm performance. Empirical evidence from two complementary studies reveals that marketing exploration and exploitation capabilities have an impact of firm performance in varying environments. The results indicate that the returns from exploitation capabilities are achieved in the short-term and exploration capabilities are realized in the future. In dynamic environments, both exploration and exploitation can contribute to firm performance and that overemphasis on either capability can be detrimental in the near term. Exploitation capabilities can negatively impact future performance in low dynamic environments but in periods of high dynamism can positively impact firm performance. Surprisingly, these results indicate exploration capabilities have the same moderating influence as exploitation in low and high dynamic environments.

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## APPENDIX

TABLE 2-10: PREVIOUS SCALES ON EXPLORATION AND EXPLOITATION

Atuahene-Gima 2005 Reference: (Zahra, Ireland, and Hitt 2000)

2005	<p><i>Competence exploitation</i> (.86)</p> <p>Over the last three years, to what extent has your firm</p> <ol style="list-style-type: none"> <li>1. Upgraded current knowledge and skills for familiar products and technologies?</li> <li>2. Invested in enhancing skills in exploiting mature technologies that improve productivity of current innovation operations?</li> <li>3. Enhanced competencies in searching for solutions to customer problems that are near to existing solutions rather than completely new solutions?</li> <li>4. Upgraded skills in product development processes in which the firm already possesses significant experience?</li> <li>5. Strengthened our knowledge and skills for projects that improve efficiency of existing innovation activities?</li> </ol> <p><i>Competence exploration</i> (.83)</p> <p>Over the last three years, to what extent has your firm</p> <ol style="list-style-type: none"> <li>1. Acquired manufacturing technologies and skills entirely new to the firm?</li> <li>2. Learned product development skills and processes (such as product design, prototyping new products, timing of new product introductions, and customizing products for local markets) entirely new to the industry?</li> <li>3. Acquired entirely new managerial and organizational skills that are important for innovation (such as forecasting technological and customer trends; identifying emerging markets and technologies; coordinating and integrating R&amp;D; marketing, manufacturing, and other functions; managing the product development process)?</li> <li>4. Learned new skills in areas such as funding new technology, staffing R&amp;D function, training and development of R&amp;D, and engineering personnel for the first time?</li> <li>5. Strengthened innovation skills in areas where it had no prior experience?</li> </ol>
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Auh & Menguc 2005 Reference: (Spanos and Lioukas 2001)

2005	<p><i>Exploitation</i> (.87)</p> <ol style="list-style-type: none"> <li>1. Modernization and automation of production processes</li> <li>2. Efforts to achieve economies of scale</li> <li>3. Capacity utilization</li> </ol> <p><i>Exploration</i> (.89)</p> <ol style="list-style-type: none"> <li>1. Research and development expenditures for product development</li> <li>2. Research and development expenditures for process innovation.</li> <li>3. Rate of product innovations in marketing techniques</li> </ol>
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Bierly & Daly 2007 Reference: (He and Wong 2004)

2007	<p><i>Exploration</i> (0.75)</p> <ol style="list-style-type: none"> <li>1. We frequently experiment with radical new ideas (or ways of doing things).</li> <li>2. At our company, employees frequently come up with creative ideas that challenge conventional ideas.</li> <li>3. Compared to our principal competitors, a high percentage of our company sales come from new products launched within the past 3 years.</li> <li>4. We are usually one of the first companies in our industry to use new, breakthrough technologies.</li> </ol> <p><i>Exploitation</i> (0.73)</p> <ol style="list-style-type: none"> <li>1. At our company, a strong emphasis is placed on improving efficiency.</li> <li>2. Our company excels at refining existing technologies.</li> <li>3. We frequently adjust our procedures, rules, and policies to make things work better.</li> </ol>
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He and Wong 2004

- 2004 | *Explorative innovation Strategy* (.752)
1. Introduce new generation of products.
  2. Extend product range.
  3. Open up new markets.
  4. Enter new technology fields
- Exploitative innovation Strategy* (.807)
1. Improve existing product quality.
  2. Improve production flexibility.
  3. Reduce production cost.
  4. Improve yield or reduce material consumption

Im and Rai 2008      Reference: (He and Wong 2004)

- 2008 | *Exploitative Knowledge Sharing* (.95)
1. Our companies exchange knowledge related to improving compliance with short-term goals.
  2. Our companies exchange knowledge to refine existing measures for assessing short-term performance goals.
  3. Our companies exchange knowledge for low-risk, short-term improvements.
  4. Our companies exchange knowledge related to refining a few selected parts of the supply chain services process.
- Exploratory Knowledge Sharing* (.96)
1. Our companies exchange knowledge related to experimentation (e.g., pilot tests) for new business opportunities.
  2. Our companies exchange knowledge related to strategies for long-term success.
  3. Our companies exchange novel ideas for the long-term success of the relationship.
  4. Our companies exchange knowledge related to new approaches for end-to-end supply chain services process integration.

Jansen, George, Van Den Bosch & Volberda 2009      Reference: ( Jansen et al., 2006)

- 2009 | *Exploratory innovation* (.86)
1. Our organization accepts demands that go beyond existing products and services
  2. We commercialize products and services that are completely new to our organization
  3. We frequently utilize new opportunities in new markets
  4. Our organization regularly uses new distribution channels
- Exploitative innovation* (.70)
1. We frequently make small adjustments to our existing products and services
  2. We improve our provision's efficiency of products and services
  3. We increase economies of scales in existing markets
  4. Our organization expands services for existing clients

Jansen, George, Van Den Bosch & Volberda 2006      Reference: (Abernathy and Clark 1985, Benner and Tushman 2003, Lewin et al. 1999, March 1991, Uzzi and Lancaster 2003)

- 2006 | *Exploratory innovation* (.86)
1. Our unit accepts demands that go beyond existing products and services.
  2. We invent new products and services.
  3. We experiment with new products and services in our local market.
  4. We commercialize products and services that are completely new to our unit.
  5. We frequently utilize new opportunities in new markets.
  6. Our unit regularly uses new distribution channels.
  7. We regularly search for and approach new clients in new markets.(R)
- Exploitative innovation* (.80)
1. We frequently refine the provision of existing products and services.
  2. We regularly implement small adaptations to existing products and services.
  3. We introduce improved, but existing products and services for our local market.
  4. We improve our provision's efficiency of products and services.
  5. We increase economies of scales in existing markets.
  6. Our unit expands services for existing clients.
  7. Lowering costs of internal processes is an important objective.(R)

Jansen, Vera, & Crossan 2009      Reference: (Jansen et al. 2006)

- 2009 | *Exploratory innovation* (.86)
1. Our organization accepts demands that go beyond existing products and services
  2. We commercialize products and services that are completely new to our organization
  3. We frequently utilize new opportunities in new markets
  4. Our organization regularly uses new distribution channels
- Exploitative innovation* (.70)
1. We frequently make small adjustments to our existing products and services
  2. We improve our provision's efficiency of products and services
  3. We increase economies of scales in existing markets
  4. Our organization expands services for existing clients

Kyriakopoulos & Moorman 2004

- 2004 | *Marketing exploitation strategies* (formative)
- During this project, we improved our prior skills and procedures with respect to each of the following areas:
1. Targeting and segmentation
  2. Product positioning and differentiation
  3. Product distribution
  4. Product design
  5. Product quality
  6. Pricing
  7. Promotion
- Marketing exploration strategies* (formative)
- During this project, we challenged and/or changed our prior thinking with respect to each of the following areas:
1. Targeting and segmentation
  2. Product positioning and differentiation
  3. Product distribution
  4. Product design
  5. Product quality
  6. Pricing
  7. Promotion

Li, Lin, & Chu 2008      Reference: (Jansen et al. 2006)

2008 | *Radical innovation* (exploratory) (.89)  
 1. Our firm accepts demands that go beyond existing products and services  
 2. We invent new products and services  
 3. We experiment with new products and services in our local market  
 4. We commercialize products and services that are completely new to our firm  
 5. We frequently utilize new opportunities in new markets  
 6. Our firm regularly uses new distribution channels  
*Incremental innovation* (exploitative) (.85)  
 1. We frequently refine the provision of existing products and services  
 2. We regularly implement small adaptations to existing products and services  
 3. We introduce improved, but existing products and services for our local market  
 4. We improve our provision's efficiency of products and services  
 5. We increase economies of scales in existing markets  
 6. Our firm expands services for existing clients

Lubatkin, Simsek, Ling, &Veiga 2006      Reference: (He and Wong 2004; Benner and Tushman 2003)

2006 | *Exploratory orientation* (.84)  
 Described the firm as one that  
 1. Looks for novel technological ideas by thinking “outside the box”  
 2. Bases its success on its ability to explore new technologies,  
 3. Creates products or services that are innovative to the firm  
 4. Looks for creative ways to satisfy its customers’ needs  
 5. Aggressively ventures into new market segments  
 6. Actively targets new customer groups  
*Exploitative orientation* (.83)  
 Described the firm as one that  
 1. Commits to improve quality and lower cost,  
 2. Continuously improves the reliability of its products and services,  
 3. Increases the levels of automation in its operations,  
 4. Constantly surveys existing customers’ satisfaction,  
 5. Fine-tunes what it offers to keep its current customers satisfied,  
 6. Penetrates more deeply into its existing customer base.

Menguc & Auh 2006      Reference: (Dess and Davis's 1984, Miller's 1988, Spanos and Lioukas' 2001 and He and Wong 2004)

2008 | Formative  
*Exploitation* (formative)  
 1. Modernization and automation of production processes  
 2. Efforts to achieve economies of scale  
 3. Capacity utilization  
*Exploration* (formative)  
 1. Research and development expenditures for product development  
 2. Research and development expenditures for process innovation  
 3. Rate of product innovations in marketing techniques

Sarkees, Hulland, Prescott 2010      Reference: (Gibson and Birkinshaw 2004 Menon, Bharadwaj, Adidam, and Edison 1999)

2010	<p><i>Firm exploitation (.77)</i></p> <ol style="list-style-type: none"> <li>1. This organization works coherently to support its overall objectives</li> <li>2. This organization uses its resources effectively</li> <li>3. Management provides clear goals and objectives for the functional units</li> </ol> <p><i>Firm exploration (.77)</i></p> <ol style="list-style-type: none"> <li>1. We are encouraged to challenge outdated traditions and practices</li> <li>2. This organization is flexible enough to allow us to respond quickly to market changes</li> <li>3. This organization evolves rapidly in response to shifts in our business priorities</li> </ol> <p><i>Marketing exploitation (.76)</i></p> <ol style="list-style-type: none"> <li>1. We focus on refining our existing products/services</li> <li>2. We are very efficient in serving our current customers</li> <li>3. We work well with other functional units in this organization</li> <li>4. We apply knowledge from other functional units to better serve our current customers</li> </ol> <p><i>Marketing exploration (.68)</i></p> <ol style="list-style-type: none"> <li>1. We interact regularly with customers in emerging market segments</li> <li>2. We focus on developing new product/services for our customers</li> <li>3. We have a broad range of products/services</li> <li>4. We have extensive customer service capabilities</li> </ol>	Vorhies, Orr, and Bush 2010      Reference: Atuahene-Gima 2005; Kyriakopoulos and Moorman 2004)
2010	<p><i>Marketing Exploitation Capabilities (.91)</i></p> <p>Please indicate how your business uses market knowledge to make modifications to existing marketing processes, relative to your main competitors.</p> <ol style="list-style-type: none"> <li>1. Consistently reexamining information from previous projects and/or studies to modify existing marketing processes</li> <li>2. Routinely adapting existing ideas when developing new marketing processes.</li> <li>3. Incrementally and routinely improving our existing marketing procedures.</li> <li>4. Focusing changes in marketing procedures on improving efficiency.</li> </ol> <p><i>Marketing Exploration Capabilities (.91)</i></p> <p>Please indicate how your business uses market knowledge to change the way it thinks and to create new, or replace, existing marketing processes, relative to your main competitors.</p> <ol style="list-style-type: none"> <li>1. Continually developing new marketing procedures that are very different from others developed in the past.</li> <li>2. Routinely introducing new marketing procedures which are daring, risky, or bold.</li> <li>3. Consistently using market knowledge to develop new marketing processes which deliver different outputs from existing processes.</li> <li>4. Using marketing knowledge to “break the mold” and create new marketing processes not used before.</li> </ol>	Voss, Sirdeshmukh, & Voss 2008      Reference: ( Atuahene-Gima 2005; Kyriakopoulos and Moorman 2004)
2008	<p><i>Product exploration (.83)</i></p> <ol style="list-style-type: none"> <li>1. Creating revolutionary new conceptual approaches.</li> <li>2. Experimenting with radical new works.</li> <li>3. Challenging traditional artistic boundaries.</li> </ol> <p><i>Product exploitation (.72)</i></p> <ol style="list-style-type: none"> <li>1. Maximizing the contribution of our in-house artistic/production skills.</li> <li>2. Offering shows that stay close to our known strengths.</li> <li>3. Producing shows similar to those that have done well for us in the past.</li> </ol>	Zahra, Ireland & Hitt 2008      Reference: (Dodgson, 1991a, 1991b; Huber, 1991; Nonaka & Takeuchi, 1995; Senge, 1990)

- 2000 | **Depth** refers to a venture's mastery of new knowledge, evidenced by an ability to draw new conclusions and find new links among diverse knowledge bases. "In the course of their international operations companies sometimes learn different things or gain new insights. Listed below are several items that pertain to a company's technology (defined as know-how), research and development, and technological innovation activities. Please read each statement carefully and then indicate the extent your company has gained knowledge and new insights, or learned skills or capabilities from its international business operations in each of the areas listed below.
- Breadth** denotes the multiple areas in which a venture learns new technological skills. "Please indicate how well your company has learned or mastered new skills in each of the areas listed below. As you evaluate these items, please bear in mind that we are interested in the depth or quality of learning your firm has attained because of its international operations.
1. Designing new products (processes)
  2. Prototyping new products (processes)
  3. Pretesting new products (processes)
  4. Timing new product (process) introductions
  5. Sequencing new product (process) introductions
  6. Customizing products for local markets
  7. Manufacturing
  8. Sourcing technology
  9. Integrating technologies acquired from other companies with your own technologies
  10. Organizing the R&D function
  11. Staffing the R&D function
  12. Determining R&D spending levels
  13. Funding new technology
  14. Managing the R&D process
  15. Coordinating R&D with other organizational units (functions)
  16. Identifying emerging technologies
  17. Forecasting technological trends
  18. Transferring technologies across international borders
  19. Protecting your technological trade secrets

## VITA

### JOSEPH MITCH PRICE

*Curriculum Vitae*

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#### EDUCATION

**Doctor of Philosophy** Business Administration, University of Mississippi  
Major Area: Marketing Strategy  
Minor Area: Pharmaceutical Marketing

**Masters of Business Administration** Union University, Jackson TN

**Bachelor of Business Administration** Harding University, Searcy AR  
Major Area: Business Systems

#### DISSERTATION

Title: Essays on the Strategic Implications of Marketing Capabilities: Marketing Exploration and Exploitation

Committee: Douglas W. Vorhies (Chair), Victoria D. Bush, Hugh J. Sloan III, John P. Bentley

**Abstract:** *My dissertation contributes to the literature on organizational learning, competitive advantage, and marketing capabilities by examining the impact of exploration and exploitation capabilities on firm performance. Firms face the strategic decisions of whether to explore “new possibilities” or exploit “old certainties” in the search for a competitive advantage. The first essay reviews previous empirical, simulation, and theoretical studies to provide a synopsis and quantitative assessment of previous empirical research. The organizational performance implications of both exploration, exploitation, and their interaction (i.e., an ambidexterity) are evaluated through the substantiation of previous findings. Exploration and exploitation focus are discrete options that require a cognitive choice and are constrained by firm resources. The results show exploitation as having the greater relative impact on performance followed by exploration and ambidexterity on performance. The next essay conceptualizes marketing capabilities as exploitation and exploration. I construct objective financial measures of marketing exploration and exploitation using efficiencies measure by a Stochastic Frontier Estimation. These measures are shown to correlate well with subjective measures via a cross-industry survey of marketing executives using previously established scales. This essay uses multiple data sources in a longitudinal analysis of 362 publicly-traded manufacturing and*



*service companies over a 5 year period. The results show a positive relationship between marketing exploitation and current organizational performance, a positive relationship between marketing exploration and forward-looking performance, and evidence that these relationships are impacted by industry dynamism and firm slack. Results also indicate that in times of high dynamism marketing exploration and exploitation have a positive impact on firm performance.*

## **PROFESSIONAL EXPERIENCE**

**University of Mississippi**, University, MS  
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## **TEACHING EXPERIENCE**

Professional Selling  
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## TEACHING INTERESTS

Desire to teach MBA and EMBA

Graduate and Undergraduate Levels: Strategic Marketing, Marketing Management, Marketing Research, Sales and Sales Management, B2B Marketing, International Marketing

## JOURNAL ARTICLES UNDER REVISION

Douglas W. Vorhies, J. Mitch Price, Neil A. Morgan, & Larry Yarbrough, “Business Service Firms’ Organizational Culture and Market Information Processing: Key Linkages with Customer Satisfaction and Cash Flow Outcomes.” First Revision submitted to Industrial Marketing Management

**Abstract:** *The marketing literature highlights organizational culture and market information processing as particularly important drivers of a firm’s ability to adapt to its environment and thereby achieve superior business performance. However, understanding of the cultural antecedents and business performance consequences of firms’ market information processing behaviors remains limited in a number of important ways. Drawing on competing values theory, our empirical study addresses these knowledge gaps by empirically examining relationships between firms’ organizational culture, their market intelligence generation, dissemination, and responsiveness behaviors, their customers’ self-reported satisfaction, and firms’ objective cash flow performance. This research is conducted in the freight segment of the US trucking industry which provides key supply chain and distribution functions to business servicing end user customers. Results reveal that different facets of organizational culture impact the generation, dissemination, and responsiveness to market intelligence differently, and that responsiveness to market intelligence is positively related to both firms’ customer satisfaction performance and the efficiency with which firms generate cash flows. However, the important effects of organizational culture on firms’ market information processing behaviors revealed in our data indicate that developing and enhancing market information processing within firms is considerably more complex than is typically suggested in the marketing literature.*

## WORKING PAPERS AND WORK IN PROGRESS

Wenbin Sun, **J. Mitch Price**, & Douglas W. Vorhies, “Reducing Cash Flow Volatility through Investments in Market-Based Assets: Advertising, Selling, and Research and Development.” Data collection is complete, finalizing the manuscript touches.

**J. Mitch Price**, “Fast Track Marketing: An Investigation of Internal and External Drivers for Firm Success.” Data collection is complete.

**J. Mitch Price**, “Brand Equity: Positioning Brand Presence in Business-to-Business Relationships.” Data collection is in progress.

**J. Mitch Price** & Mario Hayek, “Entrepreneurial Orientation: The Contingent Impact of Marketing Capabilities.” Manuscript is in progress.

## CONFERENCE PRESENTATIONS – REFEREED

**J. Mitch Price** (2010), “Brand Equity: Positioning Brand Presence in Business-to-Business Relationships.” Southeast Marketing Symposium, Annual Conference, University of Memphis, Memphis, TN

**J. Mitch Price & Marie Barnard** (2010), “Cost-Benefit Analysis of Varenicline (Chantix) vs. Existing Smoking Cessation Strategies in Pregnant Women.” ISPOR 15th Annual International Meeting, Atlanta, GA

Marie Barnard & **J. Mitch Price**, (2010) “Cost-Benefit Analysis of Varenicline (Chantix) vs. Existing Smoking Cessation Strategies in Pregnant Women.” University of Mississippi School of Applied Sciences Research Symposium, University, MS

**J. Mitch Price** (2009), “Fast Track Marketing: An Investigation of Internal and External Drivers for Firm Success.” Southeast Marketing Symposium, Annual Conference, University of Alabama, Tuscaloosa, AL

**J. Mitch Price & Charles Noble** (2009), “Speed of Innovation - The Nature of Fast Track Marketing.” Academy of Marketing Science Annual Conference, Baltimore, MD

### Special Sessions

**J. Mitch Price** (Chair) “Current and Future Analytic Techniques for Research in Marketing.” AMA Educators’ Conference, Winter 2011, Participants: Rajesh Chandy, Robert Palmatier, P. K. Kannan, & Dipankar Chakravarti

**J. Mitch Price** (Co-Chair) “PhD to Professor: Current Trends, Hiring, & Interviewing in the Marketing Field.” AMA Educators’ Conference, Summer 2010, Participants: Jagdish Sheth, Peggy Cunningham, Remi Trudel, Lisa Cavanaugh, and Veronica Thomas

**J. Mitch Price** (Co-Chair) “Strategies and Solutions for the Tumultuous Job Market.” AMA Educators’ Conference, Winter 2010, Participants: Kelly Martin, Elizabeth Moore, Rajani Pillai, & Aric Rindfleisch

## UNIVERSITY RESEARCH GRANTS

Graduate School Research Grant, University of Mississippi, 2012: Summer Research  
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## PROFESSIONAL HONORS

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## **PROFESSIONAL SERVICE**

AMA Summer Educators Conference 2011, San Francisco, CA: Doctoral Student SIG  
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