ADAPTATION LEARNING:

AN AMBIDEXTROUS PERSPECTIVE

By

BINH HOA NGUYEN

Bachelor of Industrial Management
Hochiminh City University of Technology
Hochiminh City, Vietnam
1998

Master of Business Administration
Asian Institute of Technology
Pathumthani, Thailand
2001

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Dissertation Approved:

Dr. Gary L. Frankwick

Dissertation Adviser

Dr. Todd J. Arnold

Dr. Karen E. Flaherty

Dr. Margaret A. White

Outside Committee Member

Dr. Sheryl A. Tucker

Dean of the Graduate College

.

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CHAPTER I

INTRODUCTION

A dynamic business environment is generally associated with threats and opportunities that require appropriate strategies for adaptation. Such strategies are related to how firms maintain relationships with supply chain partners. That is, through adaptation, a process aiming at satisfying partner evolving needs, firms learn how to improve efficiency and flexibility to deal with market changes and technological development. This learning process has been found important for firm capabilities and performance. For example, adaptation involves relationship-specific investments that aim to improve cost efficiency, add new value, and strengthen long-term relationship commitment (Cannon and Perreault 1999). Adaptation can also be an important strategy to develop internal capabilities toward a firm's general customer base as well as specific partners (Kang, Mahoney, and Tan 2009). However, research remains sparse and silent on whether and how this learning process may affect performance. This is the goal of the dissertation.

In the extant literature, adaptation involves transaction- or relationship-specific investment that serves as economic bonding that has little value outside a focal relationship

(Subramani and Venkatraman 2003). Relationship specific investment then motivates firms to use certain safeguards to control partner opportunism (Subramani and Venkatraman 2003). In the relationship development process, interfirm adaption results in trust and commitment building efforts of partners (Cannon and Perreault 1999). These concerns, however, seem to overlook the fact that adaptation involves adaptive learning (March 1991). In particular, adaptation is defined as "behavioral or structural modifications, at the individual, group, or corporate level, carried out by one organization, which are initially designed to meet specific needs of one other organization" (Brennan and Turnbull 1998a, p.31). As such, adaptive learning, or learning that helps firms adapt to partner changing needs, may be the key for successful adaptation. Therefore, this dissertation examines how firms deal with partner request for adaptation by examining the extent to which firms pursue exploitation and exploration, the two types of adaptive learning that improves firms' existing knowledge and capabilities (exploitation) and discovers new knowledge and competences (exploration) (Dodgson 1993). In particular, the dissertation examines the concept of ambidexterity, a learning approach that focuses simultaneously on exploration and exploitation.

Extant research argues that ambidexterity may offer insight for optimizing adaptive learning. Traditionally, the trade-off between exploitation and exploration has been widely accepted. This perspective is based on the proposition that exploitation and exploration are complementary in learning outcomes but mutually exclusive in learning approach and competing for firm resources. However, recent research suggests that ambidexterity is potentially an appropriate approach for improving performance (He and Wong 2004; Raisch and Birkinshaw 2008). Compared to the trade-off perspective, ambidexterity offers better learning benefits. Ambidexterity is an approach that can accelerate the speed of learning by

pursuing simultaneously the two types of learning, which leads to higher learning performance in the short-term and long-term (Raisch and Birkinshaw 2008; Raisch et al. 2009). More important, ambidexterity can also create exploration and exploitation synergy that further improves learning performance (Smith and Tushman 2005).

Being a promising approach to organizational learning, ambidexterity implies many opportunities in different business areas. Extant literature has examined ambidexterity from the perspective of organizational systems in which several structural and contextual characteristics have been identified as important catalysts for ambidexterity (Cao, Gedajlovic, and Zhang 2009; Gibson and Birkinshaw 2004; O'Reilly III and Tushman 2008; Raisch and Birkinshaw 2008). For example, firms may organize their structure around exploitation and exploration teams or units to develop comprehensive portfolios of innovation or may build supportive working environments that motivate organizational members focus on both learning modes (Gibson and Birkinshaw 2004; Smith and Tushman 2005). Marketing has also been implied as having favorable conditions to realize the benefits of ambidexterity (Kyriakopoulos and Moorman 2004). However, such understanding has not been studied sufficiently. As a result, much of what has been known provides few implications for both marketing academia and practitioners. This dissertation, focusing on the learning nature of adaptation and seeks to explore the effects of adaptation, an important business to business marketing process, on performance through the lens of ambidexterity.

Problem Statement

Organizational learning is critical for firms to undertake adaptation and to achieve marketing successes. The overall objective of this dissertation is then to examine whether adaptation, through ambidexterity, helps firms improve their performance. To address this

research issue, the specific questions are whether: (1) adaptation ambidexterity improves performance, and (2) whether the marketing environment characteristics of adaptation affect that relationship.

Conceptual Development

To address the research questions, adaptation ambidexterity is developed. Adaptation ambidexterity is defined as an intrafirm process of balancing and integrating exploration and exploitation learning in a firm's partner-specific investment strategy to develop products according to that partner's changing requirements. Adaptation balance helps firms maintain their focus to achieve short-term and long-term performance. Meanwhile, adaptation integration helps develop synergies gained from the interaction of exploration and exploitation in the adaptation process.

In this dissertation, the focus of adaptation is on product development, the most common type of adaptation. Adaptation ambidexterity is then posited to improve new product success. This hypothesis is based on the proposition that ambidexterity and adaptation reinforce each other by their nature. Ambidexterity optimizes and sustains the capacity of adaptation by fine-tuning adaptation short-term and long-term efforts, thus improving satisfaction and strengthening interfirm relationships. In return, given involvement in both explorative and exploitative activities, adaptation acts as a condition that facilitates exploration and exploitation integration. This condition is a critical factor that motivates the application of ambidexterity in an interfirm relationship context. It is based on the relationship marketing paradigm in which long-term orientation of relationships is emphasized. As such, short-term and long-term focuses in adaptation are both addressed. As

a result, adaptation is a favorable learning environment in which exploitative and explorative learning are most likely to be integrated.

Adaptation is also characterized by environmental factors that influence how learning takes place (Brennan, Turnbull, and Wilson 2003). These factors can be both marketing-general and interfirm relationship-specific (Brennan, Turnbull, and Wilson 2003; Buvik and Grønhaug 2000). Of particular interest are two typical conditions: environmental turbulence and partner dependence. Environmental turbulence is the extent to which the business environment is characterized by high levels of risk and uncertainty, often relating to market preferences and technological development (Hanvanich, Sivakumar, and Hult 2006; Jaworski and Kohli 1993). Environmental turbulence, therefore, is associated with the level of organizational learning required. Meanwhile, partner dependence reflects the power of a partner due to its control of a firm's complementary resources, thus affecting the intensity of a firm's adaptation (Hallen, Johanson, and Seyed-Mohamed 1991). The need for adaptation to create more value for partners and to develop exchange relationships would leverage the effect of ambidexterity.

Study Overview

The dissertation develops scales for adaptation ambidexterity, adaptation balance and adaptation integration. In addition, the analysis method of multiple moderated regression is used for main effects and moderation effects. The study employs a cross-sectional design and examines the hypothetical relationships. Key participants to be surveyed will be determined using a random list of high-tech firms. The database of these firm will be obtained from Corporate Technology Information Services (CorpTech), a firm specializing in US-based high-tech company profiles.

Potential Contribution

The dissertation aims at advancing marketing theory and practice in interfirm relationships in several directions. For marketing practitioners, adaptation ambidexterity offers an opportunity to take advantage of interfirm relationships for improving business performance. From the perspective of relationship marketing, adaptation ambidexterity enhances the understanding of Selnes and Sallis's (2003) relationship learning and Workman, Homburg, and Jensen's (2003) key account management. It offers a mechanism explaining how relationship learning efforts improve performance, thus specifying strategic implications for practitioners.

For theory development, significant contributions to theory can be seen through this application of ambidexterity in the field of relationship marketing. If the model proposed by this dissertation is empirically supported, it is evidence for the emerging theory of ambidexterity and an initial explanation of the effect of ambidexterity on performance. Marketing, as an environment that nurtures the integration of exploration and exploitation therefore implies potential contexts to address the issue. In particular, there is a wide spectrum of relationship-based factors that affect how firms interact, learn, and do business at different organizational levels. Further research on these issues would greatly contribute to understanding of the ambidexterity concept and its capability for improving marketing practices.

Study Scope and Limitation

As the first step to explore ambidexterity in relationship marketing, this dissertation focuses on ambidexterity as an intrafirm process in the context of product development adaptation. A direct effect of ambidexterity on performance is another characteristic of scope.

The dissertation then investigates whether adaptation ambidexterity in new product marketing contexts affects performance.

Key limitations of this dissertation involve the survey method and the population of firms that will be approached for data collection. Cross-sectional design and high-tech firms are selected based on the considerations of the study resources and significance of research findings. However, interpretation of results will be limited to high-tech firms and future research may be needed to address generalization beyond this.

Study Organization

This chapter provided an overview of study which applies the ambidexterity concept to adaptation learning. Chapter II reviews the literature of organizational learning and relationship marketing and then presents the theoretical constructs and several research hypotheses based on extant literature. Chapter III details the methodology of the study which includes the research design, data collection procedure, and variable measurement method. Chapter IV describes results of data analysis and hypothesis testing. Finally, chapter V discusses the findings and their implications for marketing theory and practice. Conclusions and recommendations for future research are also included in this chapter.

CHAPTER II

LITERATURE REVIEW

Organizational Learning

Generally, organizational learning refers to a state of improvement in knowledge and skills from which firms can sustain performance. Specifically, organizational learning involves two types of learning: exploration and exploitation (Slater and Narver 1995). These types are also learning objectives that help firms accumulate knowledge and build capability for performance. Exploitation improves firms' existing knowledge and capabilities, whereas exploration discovers new knowledge and competences (Dodgson 1993). Exploitation follows what is described as single-loop learning and exploration as double-loop learning processes (Argyris 1976). In double-loop learning, new knowledge comes from changing basic elements (assumptions, principles, or values) of existing knowledge systems (Argyris 1983; Argyris 1976). In contrast, single-loop learning seeks to improve knowledge and competence within the context of those fundamental elements. Single-loop learning is limited and short-term, while double-loop learning is long-term and more robust (Argyris 1983; Argyris 1976). The purpose of

exploitation is “adaptive variety” that responds to internal and external environmental changes, while that of exploration is “frame-breaking” to develop new superiority (Slater and Narver 1995, p. 64). As a result, it is established that both types of learning are important and are required for success (March 1991). However, firms often have difficulty in pursuing a comprehensive learning strategy which focuses on both exploration and exploitation.

Organizational Learning Difficulty

Given a sole focus on exploration wastes profit potential of existing competence, a sole focus on exploitation leads to obsolescence of competence in the long-term. Sustaining firm performance requires businesses to balance between exploitation and exploration (March 1991). Yet, such a perceived balance is almost impossible to determine within and across organizational units and levels (March 1991). In addition, internal and external factors such as strategic orientation or technological turbulence may restrict strategic alternatives or require dynamic responses to environmental changes. Defenders tend to favor exploitation while high technological turbulence calls for more focus on exploration (Hanvanich, Sivakumar, and Hult 2006; Menguc and Auh 2008).

Another issue in pursuing a comprehensive learning strategy is the relationship between exploration and exploitation. On one side, the difference between exploitation and exploration tends to create unrelatedness. Firms face a trade-off relationship in making investments in which exploration and exploitation compete for scarce resources (Atuahene-Gima and Murray 2007). On the other side, the single-loop nature of exploitation and the double-loop nature of exploration refer to the degree of learning rather than two separate, mutually exclusive classes (Gupta, Smith, and Shalley 2006).

There are turning points at which a certain accumulation of exploitation induces exploration and vice versa (Holmqvist 2004; March 2006). Or, incremental innovation may contribute to structural innovation and vice versa due to high interdependence among product component systems (Brusoni and Prencipe 2001; March 2006). As the interaction results from knowledge search and integration (Taylor 2010), the key concern for an effective learning strategy is how to develop this synergistic relationship. Research has taken this interaction into consideration and suggests the concept of ambidexterity, which means simultaneously pursuing exploration and exploitation (Duncan 1976; Gibson and Birkinshaw 2004; Smith and Tushman 2005).

Ambidexterity

Ambidexterity assumes that exploration and exploitation interact with each other and create learning synergy that subsequently improves the total learning effect. Once this happens, interaction becomes an important mechanism that addresses the initial problems of exploration-exploitation. It eases the complexity of balancing learning focuses by specifying potential interaction. Appropriate learning strategy should promote this synergy, thus supporting the balancing task. In addition, the learning synergy enhances exploration and exploitation, equipping firms with the capacity to learn more or faster compared to that of the trade-off. This helps firms lower the barrier of resource constraints and improve the productivity and effectiveness of their learning.

Ambidexterity, hence, is about balancing and integrating exploration and exploitation. Balancing, the level of “match in the relative magnitude of exploratory and exploitative activities” (Cao, Gedajlovic, and Zhang 2009, p.783), not only sustains long-term learning but also optimizes the effect of interaction. Integration, the effort to

leverage knowledge from exploitation and exploration, improves overall learning and leads to simultaneously high levels of exploration and exploitation that represent ambidexterity. For implementing ambidexterity, extant literature presents two organic processes, namely differentiation and integration (Smith 2009). According to this literature, firms should maintain exploration and exploitation as two different learning focuses and, at the same time, integrate them. Towards these processes, there are two schools of thought. The first suggests differentiation as having different learning units specializing in each learning focus within an organization (Duncan 1976). It also suggests that management above these units then integrates the explorative and exploitative learning (Jansen et al. 2008; Smith and Tushman 2005). According to this school, the two learning approaches are so different that a structural differentiation would make exploration and exploitation proceed appropriately. Management, with a broad overview of the landscape, would also be appropriate for connecting these two types of learning units. Research on innovation has supported this structural ambidexterity and provides insight on management involvement and cross-organizational ambidexterity (Raisch et al. 2009; Simsek 2009). The other school of thought recommends that integration takes place where learning occurs (Gibson and Birkinshaw 2004; Raisch et al. 2009). Although management efforts may be a source for learning synergy, this differentiation – integration isolation misses the opportunity for realizing another type of synergy, which comes from the interaction among explorative and exploitative learners. This school of thought suggests an alternative, namely contextual ambidexterity.

In contextual ambidexterity, differentiation and integration occur within a learning unit in which each individual pursues exploration and exploitation and searches

for learning synergy. Given the differences between exploration and exploitation learning processes, this ambidexterity assumes that firms develop an appropriate organizational context to support "paradoxical thinking" (Gibson and Birkinshaw 2004, p. 209). In particular, this thinking can be motivated by "behavior-framing attributes" (Gibson and Birkinshaw 2004, p. 213) and a variety of factors such as informal networks (Gulati and Puranam 2009), leadership's learning focus diversity (Beckman 2006), or top management as integrators (Lubatkin et al. 2006). However, while addressing the weakness of structural ambidexterity, this school of thought also develops its own problem. Differentiation and integration become two dialectical halves of ambidexterity, as each individual is responsible for both processes. The dialectic may be limited given the bounded rationality of individuals, thus reducing the effect of contextual ambidexterity.

Although both types of ambidexterity have been empirically supported, there is still concern about how to differentiate and integrate learning modes and how to allocate responsibility for differentiation and integration (Raisch et al. 2009). At the present time, the structural and contextual approaches have not addressed these issues sufficiently. This ongoing development has created an opportunity for Simsek's (2009) realized ambidexterity to be considered. Realized ambidexterity assumes that firms may have whatever processes for differentiation and integration which may be known or unknown. Raisch et al. (2009) call for more research on the issue. As a result, realized ambidexterity has no involvement in the conversation between the two schools of thought. Realized ambidexterity is then defined as the balance and the integration between actual exploration and exploitation (Cao, Gedajlovic, and Zhang 2009; He and

Wong 2004). In line with research examining effects of ambidexterity, I adopt the realized ambidexterity perspective for this dissertation.

Adaptation Ambidexterity

This study applies the phenomenon of ambidexterity to interfirm relationships where relationship-specific adaptation or transaction-specific adaptation is the setting in which learning takes place. Given that adaptation ambidexterity, as a learning approach, may help improve firm capabilities and sustain performance, this section provides a review of how learning associates with adaptation. In particular, the section explains why adaptation is important to both giving and receiving partners, then shows why adaptation is a learning process that relates to both exploration and exploitation, and finally develops a definition of adaptation for the dissertation. The ultimate objective of this section is to specify a definition of adaptation ambidexterity for the dissertation.

Adaptation is important to relationship partners in two ways. It is the mechanism for improving products and services and nurturing exchange relationships. It has been defined as "behavioral or structural modifications at the individual, group or corporate level, carried out by one organization, which are initially designed to meet specific needs of one other organization" (Brennan and Turnbull 1998b, p.32). This is also a "coordinated and cooperative response to change" (Gulati, Lawrence, and Puranam 2005, p.415). As a result, adaptation customizes product offerings, creating higher value for partners and maintaining responsiveness to partner requirements. In addition, adaptation often associates with investment, ranging from human intellect to physical facilities (Williamson 1985). As a means of adaptation, this investment is specific to a transaction or relationship, making its benefit less obvious in other relationships or transactions.

Therefore, adaptation is a relationship commitment to a partner. For firms that adapt, adaptation provides an opportunity for building competence with knowledge and experience accumulating and residing in organizational memory and the learning systems (Hanvanich, Sivakumar, and Hult 2006; Kang, Mahoney, and Tan 2009). This learning effect is embedded in the process of adaptation by nature (March 1991).

Theoretically, March (1991) suggests that adaptation is a learning process in which firms follow both exploration and exploitation for long-term survival. However, he also notes that firms may adopt the trade-off perspective where exploitation dominates exploration for exploitation's high visibility and short-term success (March 2006). At best, this short-term survival-bounded strategy goes against the marketing objective for long-term exchange relationships and raises a concern whether ambidexterity may help firms improve their learning. In fact, extant literature suggests that adaptation involves several activities that may relate to different degrees of learning (Hakansson 1982; Hallen, Johanson, and Seyed-Mohamed 1991; Homburg, Workman, and Jensen 2002; Turnbull and Valla 1986). Firms may engage in exploration and exploitation proactively or reactively (Cannon and Perreault 1999; Workman, Homburg, and Jensen 2003). These practices help firms respond not only directly to exchange partner needs but also to dynamism of the supply chain or business environment (Brusoni and Prencipe 2001; Fang 2008).

Given the works of Hallen, Johanson, and Seyed-Mohamed (1991), Brennan and Turnbull (1998b) and Gulati et al. (2005), I define adaptation ambidexterity as an intrafirm process of balancing and integrating exploration and exploitation in the firms' partner-specific product adaptation. For exploration and exploitation, I adopt Dodgson's

(1993) definition in which exploitation as improving firms' existing knowledge and capabilities and exploration as discovering new knowledge and competences. Three important points in the definition of adaptation ambidexterity are as follows. First, as an intrafirm process, this definition excludes the influence of reciprocity in adaptation, which may relate to safeguarding against opportunism, a factor that may misalign adaptation learning strategies. Second, the narrow focus on product addresses the most important and common type of adaptation and explicates the connection between adaptation and product-based capabilities and performance. Other types of adaptation may relate to some confused combination of knowledge areas, such as organizational structure, financial procedures, or stock and deliveries (Brennan and Turnbull 1998b). Finally, the dissertation acknowledges that a focal firm relationship with both upward and downward supply chain partners may be similar with respect to learning. That is, I assume that relationships with suppliers may be as important as those of customers because of the close interdependence between up-stream and down-stream activities (Joshi 2009). And, although the focal firm plays different roles toward suppliers and customers, the nature of adaptation is similar (Hoegl and Wagner 2005; Ritter and Walter 2003; Takeishi 2001; Wagner and Hoegl 2006; Walter 2003). However, I focus only on customers (downstream partners) for the dissertation and leave research on adaptation to suppliers for future research.

As characterized by interfirm relationships, this ambidexterity expresses how firms invest their resources to enter new product knowledge domains and improve existing product knowledge efficiency toward an existing partner. Compared to extant meanings of ambidexterity (Cao, Gedajlovic, and Zhang 2009; Gibson and Birkinshaw

2004; He and Wong 2004), adaptation ambidexterity is similar at its function but unique because of the relationship-based context.

To take advantage of ambidexterity, there are two dimensional processes in the above definition: the balance and the integration in adaptation. Adaptation balance demonstrates how firms maintain their focuses to achieve long-term performance (Cao, Gedajlovic, and Zhang 2009; He and Wong 2004). This dimension expresses ambidexterity by showing the face content of simultaneously pursuing exploration and exploitation. The second dimension, adaptation integration, presents the potential synergy gained from the interaction of exploration and exploitation in the adaptation process. Together, these two dimensions manifest a complete representation of the extent of ambidexterity. A low level of balance or integration would imply a limitation in capacity of organizational learning. A low level of balance limits the capacity to integrate the two interdependent learning domains whereas a low level of integration restricts the capacity to realize learning potentials. Therefore, a high level of both balance and integration is expected for optimal learning performance, which also means a high level of both exploration and exploitation.

Conceptual Development and Hypotheses

Focusing on relationships between firms and their customers, the dissertation addresses whether ambidexterity maintains its effect in the context of adaptation and how marketing specific factors may shape that effect. In general, research has suggested that ambidexterity directly affects performance and develops certain organizational competence that eventually improves performance (Cao, Gedajlovic, and Zhang 2009; He and Wong 2004; Im and Rai 2008). Research has also implied that certain characteristics

of process or environment may affect the extent to which firms balance and integrate different learning efforts (Kyriakopoulos and Moorman 2004; Raisch and Birkinshaw 2008; Smith and Tushman 2005).

Adopting the view of ambidexterity, the dissertation proposes that adaptation is a typical marketing context in which marketing and learning mutually reinforce each other. Ambidexterity can also develop knowledge and skills for marketing-specific competences required for marketing success. As a marketing process, adaptation can strengthen the learning process by facilitating exploration and exploitation integration, based on the relationship marketing paradigm in which a long-term orientation of relationship is greatly emphasized. As such, short-term and long-term focuses in adaptation are both concerned and addressed. As a result, adaptation is a favorable learning environment in which exploitation and exploration are most likely to be integrated.

In terms of research, these discussions mean that the effects of adaptation ambidexterity on marketing performance may be direct, mediating through certain marketing competences, or interactive with marketing environmental conditions. As the first step to explore these possibilities, the dissertation examines the direct effect of adaptation ambidexterity on new product success, an indicator of marketing performance that is relevant to the scope of adaptation. It also explicates the influence of two marketing conditions: environmental turbulences and partner's dependence.

Adaptation Ambidexterity and New Product Success

In general, the direct effect of adaptation ambidexterity can be explained by its capacity to integrate different marketing and organizational processes. They are

relationship management and product development (Stump, Athaide, and Joshi 2002; Walter 2003; Workman, Homburg, and Jensen 2003). Ambidexterity then improves marketing performance by strengthening interfirm relationship exchange and making more efficient and effective product development. Without ambidexterity, adaptation is a tool for building relationships at the cost of partners' potential opportunism. Similarly, adaptation may also be an adaptive process in which the balance and integration of exploration and exploitation are not often recognized or effectively implemented (Gulati, Lawrence, and Puranam 2005). With ambidexterity, adaptation takes into account short-term and long-term focuses of interfirm relationships, high-risk and low-risk adaptation undertakings, and different levels of strategic marketing consideration (Levinthal and March 1993). This also means that a firm's marketing process is well-thought and executed through the lens of ambidexterity. The capability of ambidexterity in leveraging the effect of relationship management and product development is fundamental to the improvement of marketing performance.

In the context of new product development, paths for adaptation ambidexterity to improved performance are manifold. Ambidextrous adaptation to customers addresses the key issue of marketing, which is how to serve the market appropriately. In particular, ambidextrous adaptation can be an approach that resolves concerns about short-term and long-term development to satisfy market needs (Connor 1999; Slater and Narver 1998). This advantage leads to higher levels of integration between a firm and its customers, which positively affects new product development performance (Urban and von Hippel 1988). Another path to improved performance is with ambidextrous adaptation to suppliers. The knowledge transfer and integration between a firm and its suppliers is an

important organizational process. Adaptation to suppliers can help firms reduce cost and collaborate on new technological development and innovation. This is a process in which firms may have complex patterns of new knowledge and struggle with several potential suggestions for product improvement (Brusoni and Prencipe 2001). Ambidexterity in this situation can improve Lane and Lubatkin's (1998) relative absorptive capacity by developing shared paths for product development. That is, ambidexterity develops shared directions on which interfirm alignment of long-term and short-term focuses are achieved.

However, in the area of new product development, the effect of adaptation ambidexterity on new product success, a key performance indicator for a new product or new product development projects, is not straightforward. Even though firms may set up specific objectives or projects for new products, adaptation seems to be a continuous process with an overarching goal for certain relational exchanges (Homburg, Workman, and Jensen 2002; Workman, Homburg, and Jensen 2003). As adaptation ambidexterity involves both exploitation and exploration in product development, it is expected that such learning would improve product performance. However, there are two potential counter-arguments for such a relationship. The first is whether and how adaptation may not contribute to the new product development. The second is whether and how adaptation ambidexterity may actually create inefficiency.

The first counter-argument assumes that adaptation may in fact improve something else, not new product development. A reasonable effect of adaptation may be alignment of one partner's product to fit into the system of the other partner. The objective of alignment is interfirm coherence, rather than product development. In

addition, such coherence may often be biased to promoting exploitative learning. This is a myopia that exists in adaptation (Gulati, Lawrence, and Puranam 2005; Levinthal and March 1993). Alignment improves short-term relationship-based performance, rather than producing a long-term effect on product development. The second counter-argument also relates to this alignment. That is, being biased to adaptation exploitation, efforts to differentiate and integrate adaptation exploitation and exploration would create no synergy, if not inefficiency.

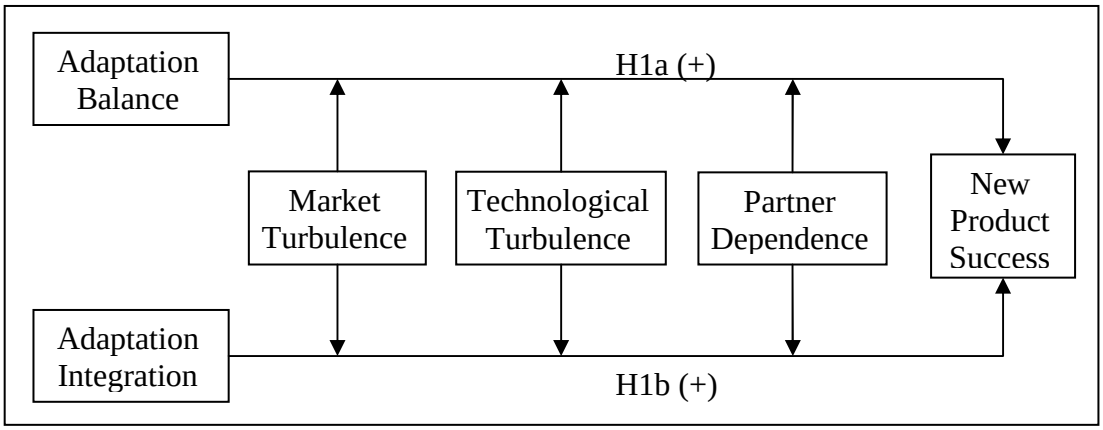
From the lens of ambidexterity, if this special case of adaptation is a firms' major practice, the conceptual development of this dissertation would not reflect reality. This dissertation argues against these counter-arguments, based on the proposition that the relationship paradigm itself is a characteristic that guarantees the effect of adaptation ambidexterity. That is, a long-term relationship focus is stronger than organizational learning inertia, especially under the conditions of market competition and supply chain dynamism. As a result, the role of adaptation exploration is appropriately understood and emphasized in adaptation.

Given the above consideration on the two counter-arguments, it is logical to suggest that the adaptation ambidexterity is better for new product development performance than the trade-off approach. Therefore, given adaptation ambidexterity is characterized by adaptation balance and adaptation integration, this dissertation posits H1 presented lexically below and graphically in figure 1.1.

H1a: New product success is positively associated with adaptation balance.

H1b: New product success is positively associated with adaptation integration.

Figure 1.1: Model of Adaptation Ambidexterity



Adaptation Ambidexterity and Environmental Turbulence

In general, marketing is an important environment that possesses several characteristics associated with ambidexterity, such as fierce competition, environmental dynamism, and learning orientation. In fact, research has suggested that marketing may involve conditions that unlock the power of ambidexterity (Kyriakopoulos and Moorman 2004). Adaptation is even a more favorable environment for ambidexterity with a long-term relationship focus and a high demand for knowledge integration (Dyer and Singh 1998). As a result, it is important to understand how certain environmental characteristics or marketing practices may facilitate or inhibit the application of ambidexterity in the context of adaptation.

Environmental turbulence typically refers to market turbulence and technological turbulence that represent how dynamic the business environment is. Environmental turbulence is a complex interaction of different business forces in which environmental

turbulence and a firm's business practice may affect each other. Such a moderating role of environmental turbulence has been observed in marketing research and in ambidexterity research (Jaworski and Kohli 1993; Raisch and Birkinshaw 2008). Environmental turbulence is an important source of motivation for raising problems related to organizational learning to be addressed (Duncan 1976; Jaworski and Kohli 1993; Teece, Pisano, and Shuen 1997). As such, environmental turbulence may affect the relationships between adaptation ambidexterity and outcomes.

Environmental turbulence is the extent to which a firm's business environment is characterized by high levels of risk and uncertainty (Hanvanich, Sivakumar, and Hult 2006; Jaworski and Kohli 1993). In particular, market turbulence relates to dynamism in market preferences; technological turbulence refers to dynamism in technological development (Jaworski and Kohli 1993). The interaction between environmental turbulence and organization learning in shaping organizational performance has been examined (Jaworski and Kohli 1993; Raisch and Birkinshaw 2008). Traditionally, environmental turbulence often associates with higher demands for environmental adaptation, which amplifies effects of organizational learning on learning outcomes (Calantone, Garcia, and Droge 2003; Han, Kim, and Srivastava 1998; Jaworski and Kohli 1993). Environmental turbulence also plays an important role in the discussion of ambidexterity. Exploration and exploitation are more effective in highly turbulent environments (Jansen, Bosch, and Volberda 2006). In line with previous research, this dissertation posits that environmental turbulence, represented by market turbulence and technological turbulence, positively associates with more business related problems to be solved by firms. On one hand, this is a challenge for organizational learning to develop

capabilities to handle problems. On the other hand, the increased number of decision making issues facilitates the recognition of potential knowledge transfers between exploitation and exploration. Both views signify the opportunities for ambidexterity as a learning improvement in highly turbulent environments. As a result, this dissertation hypothesizes that:

H2a: The relationship between new product success and adaptation balance is stronger when market turbulence is high than when it is low.

H2b: The relationship between new product success and adaptation integration is stronger when market turbulence is high than when it is low.

H3a: The relationship between new product success and adaptation balance is stronger when technological turbulence is high than when it is low.

H3b: The relationship between new product success and adaptation integration is stronger when technological turbulence is high than when it is low.

Adaptation Ambidexterity and Partner Dependence

Another variable that may influence the relationship between learning and outcomes is characterized by the evolving interdependence between business partners. Interdependence is naturally associated with adaptation as an evolving integration of partner systems. It can be observed in different dimensions of relationships, such as operations and production, information technology, or R&D activities. Interdependence plays a key role in developing appropriate forms of relationship governance. As a result, interdependence affects organizational learning through efforts for “cooperation and coordination” (Gulati, Lawrence, and Puranam 2005, p. 423). Interdependence, therefore, moderates the effects of adaptation ambidexterity on outcomes.

Interfirm relationships, as integration of complementary resources among firms, are characterized as partner dependence. This dependence determines potential influence or bargaining power of a partner in the integration process. This influence has been addressed in previous studies which adopt two views of dependence: unilateral and bilateral dependence (Anderson and Narus 1990; Hair et al. 2006; Kim and Hsieh 2003; Lusch and Brown 1996). Partner dependence affects a firm's ability to mobilize resources and maintain operations control and cooperation among partners. In addition to the embedded long-term relationship focus of adaptation, partner dependence is an important factor that determines how such focus is developed (Savin and White 1977). In general, it affects the intensity of adaptation (Hallen, Johanson, and Seyed-Mohamed 1991).

In particular, dependence on partners requires firms to focus more on key activities and processes to sustain relationship performance (Savin and White 1977). For adaptation ambidexterity, partner dependence therefore represents a mechanism that facilitates the process of balancing and integrating adaptation exploitation and exploration. Specifically, a higher level of partner dependence means a high level of integration between partner operating systems. Learning gained by one partner would be more likely to be transferred to the other. Consequently, the effect of adaptation ambidexterity on outcomes would be higher.

This moderating effect of partner dependence, however, may be questioned under the condition of interfirm relationships. Partners are often dependent on each other or in a state of interdependence or relative dependence (Anderson and Narus 1990; Kim and Hsieh 2003). As such, a negative relative dependence, another partner depends on a firm more than the firm depends on its partner, would be a significant concern. Based on the

complementary nature in interfirm relationships (Dyer and Singh 1998), this dissertation suggests that each dependence of each partner over the other is not identical, if not mutually exclusive. As a result, each partner should adopt certain approaches to handle its dependence on the other partner (Kim and Hsieh 2003). A negation of reciprocal dependence would not be appropriate for a partner for its adaptation strategy. As such, the moderating effect of partner dependence can be described as follows:

H4a: The relationship between new product success and adaptation balance is stronger when a firm's dependence on its partner is high than when it is low.

H4b: The relationship between new product success and adaptation integration is stronger when a firm's dependence on its partner is high than when it is low.

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CHAPTER III

METHODOLOGY

Sample

Given the focus on product development, US-based high-tech manufacturing firms are chosen for empirical testing. These firms have a relevant characteristic for this study – high demand for product based adaptation. Product managers are selected as key informants, who are involved in both marketing and technology related to their product lines. Product managers also work with internal and external partners on product and market-related activities. As a result, they are knowledgeable about all constructs examined in the dissertation. In addition, their information is most important and reliable. This is the argument for this dissertation to choose one-key-informant design for each dyad (Cannon and Perreault 1999; Johnson, Sohi, and Grewal 2004; Savin and White 1977; Wang et al. 2008). Contact information about firms and informants was obtained from the Corporate Technology Information Services (CorpTech), a firm specializing in US-based high-tech company profiles.

Measurement

Adaptation Balance and Integration

In the extant literature, integration has been measured as a product of exploration and exploitation; whereas balance has been measured as their absolute difference (Cao, Gedajlovic, and Zhang 2009; Gibson and Birkinshaw 2004; He and Wong 2004). In line with previous research, this dissertation examines the absolute difference as adaptation balance and the product term as integration. Measures for adaptation exploration and exploitation are adapted from Atuahene-Gima's (2005) competence exploration and exploitation.

However, the dissertation takes into account several methodological and theoretical concerns related to this current approach to balance and integration. On the methodological concern, for the measure of integration, failure to partial out the effects of independent variables confound effects of an interactive term (Irwin and McClelland 2001). Even in the study by Cao, Gedajlovic, and Zhang (2009) where exploration and exploitation are controlled, the omission of lower-order independent effects (i.e. lower-order interaction between exploration or exploitation and a moderator), given the nature of three-way interactions, also creates uninterpretable results. On the theoretical side, the current approach may also create unreliable findings on the joint effect of balance and integration . Cao, Gedajlovic, and Zhang (2009) examine the correlation of balance and integration and found that it is insignificant. That may be true for samples in which exploration and exploitation are highly balanced or narrowly different in which $|a - b|$ approaches zero value regardless of ab, the correlation between integration and balance may be insignificant as found in Cao, Gedajlovic, and Zhang (2009). However, for

samples in which exploration and exploitation is highly imbalanced or widely different, then a simultaneous examination of balance and integration in a regression equation would lead to unreliable findings, as $|a - b| = \sqrt{a^2 + b^2 - 2ab}$. As a result, this dissertation examines direct scales for balance and and integration as an alternative to the current approach in the literature.

Adaptation integration is adapted from the studies of Carmeli and Azeroual (2009) and Smith, Collins, and Clark (2005). For adaptation balance, the dissertation adapts scales from the literature of exploitation and exploration. Extant literature has used two types of measure for exploitation and exploration. One is based on the new-existing, radical-incremental, or double-single loop classifications (Cao, Gedajlovic, and Zhang 2009; Gibson and Birkinshaw 2004; He and Wong 2004). In this type of measure, the degree of learning of specific objects or activities involved is evaluated. The other type of measure is based on Levinthal and March's (1993) characteristics of learning decisions (Im and Rai 2008), which are temporal, spatial, and failure focuses. According to Levinthal and March (1993), focuses of exploration are knowledge search that is long-term, global, and high risk-taking, whereas those of exploitation are knowledge search that is short-term, local, and low risk-taking. This dissertation takes all these meanings into consideration. In addition, this dissertation focuses solely on exploitation and exploration on existing customers, as one of the key concerns of relationship marketing.

The process of scale development for adaptation balance is then as follows. First, construct domains are specified as suggested by Churchill (1999) and Rossiter (1998). Constructs are specified in terms of object, attributes (perceived characteristics of product related decisions), and rater entity (product managers). Second, an initial set of items was

generated based on a literature review of the attributes of each construct. In-depth interviews were conducted with executive managers, marketing managers, and product managers who are involved deeply in the business to business marketing process to verify these items. Then, the revised set of items based on the interviews were reviewed and pretested with a small group of marketing practitioners for their understanding and feedback. Finally, surveyed items were purified by reliability analysis for internal consistency reliability. Confirmatory factor analysis was also used to examine convergent and discriminant validity with average variance extracted criterion (Anderson and Gerbing 1988; Fornell and Larcker 1981).

New Product Success

Several measures have been developed as performance outcomes in the context of new product development. Extant research has suggested that new product success is complex and needs to be captured by multiple measures (Im and Workman 2004; Song and Parry 1997a). In addition, new product success is often operationalized as relative and subjective measures, given the unavailability of reliable objective data (Im and Workman 2004; Song and Parry 1997b). In line with previous research, this dissertation adopts multiple measures for new product success. In particular, relative measures adopted are sales, market share, return on investment, profits, and achievement of marketing objectives (Im and Workman 2004; Kleinschmidt and Cooper 1991; Page 1993; Song and Parry 1997a).

In addition, new product success is measured as a specific performance indicator toward a specific relationship partner as well as a general performance indicator. In the context of adaptation, a partner-specific focus is appropriate. However, extant research

also mentions the spillover effect of learning from adaptation (Kang, Mahoney, and Tan 2009). As such, a general focus would also provide insights on potential influence of adaptation ambidexterity.

Market Turbulence and Technological Turbulence

Jaworski and Kohli's (1993) scales for market turbulence and technological turbulence have been widely used in business literature. This dissertation adopts these scales for environmental turbulence constructs.

Partner Dependence

Different scales for partner dependence have been developed in the extant literature (Anderson and Narus 1990; Eisenberg et al. 2007; Kumar, Scheer, and Steenkamp 1995; Lusch and Brown 1996; Noordewier, John, and Nevin 1990). Lusch and Brown's (1996) scale of wholesaler – supplier dependence is most appropriate to this dissertation context, which is a global dependence between partners. This scale is adapted for partner dependence. In addition, the dissertation also adopts an alternative for this construct. That is the percent of sales to the focal customer (Eisenberg et al. 2007).

Control Variables

To examine the effect of adaptation ambidexterity on new product success, this dissertation controls the following potential new product success covariates: partner's adaptation, length of relationship, and firm size. Partner adaptation may be involved in the new product development process. Partner adaptation is adapted from Cannon and Perreault's (1999) study. Length of relationship is controlled for partner's specific knowledge that may help improve new product success. Length of relationship is the log of years in the relationship. Finally, firm size is controlled for the effect of scale in

product development activities (Im and Workman 2004). Firm size is measured by the log of number of employees (Kang, Mahoney, and Tan 2009).

Survey Development

Following Dillman's (1991) suggestions, the questionnaire is covered by an official letter that addresses the respondent with information about the survey, the issue of anonymity and benefits of participation. The procedures for the survey are as follows. First, a phone call that provides key information in the cover letter is made to obtain participation. Upon requests of subjects, questionnaires were faxed, emailed, or mailed. Follow-up reminders were used after two and four weeks of questionnaire delivery. Early and late response questionnaires were analyzed for potential bias (Armstrong and Overton 1977). In addition, a sample of non-respondents were called and asked to respond to a few independent variables. Firm size and sales will be checked using contact list profiles.

Plan of Analysis

The conceptual model and measurement model suggest that hierarchical multiple regression (HMR) were used for data analysis (Aguinis 1995; Arnold 1982; Arnold and Evans 1979; Baron and Kenny 1986). The hierarchical procedures are as follows.

Step 1: Regression of dependent variables on control variables

Step 2: Regression of dependent variables on control variables and main effects

Step 3: Regression of dependent variables on control variables, main effects, and interactions

CHAPTER IV

FINDINGS

Sampling Procedures

From the list of 4920 U.S manufacturing firms, 2319 firms were contacted by telephone asking for participation. The rest of were not contacted due to obsolete information about informants and firms and unqualified informants. There were 267 invitations made and 250 invitations accepted. Then 104 questionnaires were returned within the first two weeks, 4 were returned after the first reminder. All other participants declined to return the questionnaire after 4 weeks for the reasons of irrelevant content, confidential information, no product adaptation activity, or being too busy. Fifteen of these non-respondents were called to provide a quick response over the telephone on 5 items of different surveyed constructs. No mean differences were found between respondent and non-respondent groups. As a result, 108 questionnaires were used for further analysis. The response rate is 40.45%.

Measure Development

To develop measurement scales, the questionnaires were pretested with business managers. Two business managers at a local high-tech manufacturing firm were told about the study objectives. These managers then reviewed the questionnaire and described any difficulty in reading and understanding questions and items, resulting in minor phrasing changes to some items. Then a group of 13 business level managers were asked to review the questionnaire and provide potential feedback. At this step, no further concerns were raised about the questionnaire and no further changes were needed.

Reliability Analysis and Confirmatory Factor Analysis

Observed items in the questionnaire were then descriptively summarized for verifying missing data and coding errors. Among 108 questionnaires collected, there were 4 questionnaires with 8 missing items in total. Given this insignificant amount of missing data, all 108 questionnaires were maintained in the analysis. Items with missing data were filled with average values of items of the same construct.

To develop scales with appropriate internal consistency, items were examined through inter-item correlations, item-to-total correlations, and Cronbach's Alpha coefficients. Items with inter-item correlations less than .3 and item-to-total correlations less than .5 are candidates to be removed from the scale. The cut-off level for Cronbach's alpha is .7. The purified scales then went through a confirmatory factor analysis for discriminant and convergent validity. The factor structure is shown in the table 4.3.

Given the above criteria to maintain items for scale development, several CFA models were examined to achieve satisfactory fit. The final factor solution has Chi-Square = 74.32, df = 67, RMSEA = .032, and CFI = .98. All average variances extracted

(AVE) and reliabilities are above the standard for reliability and validity (Fornell and Larcker 1981) (table 4.3). In addition, all AVEs that are greater than all squared correlations (table 4.2), enhancing discriminant validity (Fornell and Larcker 1981). Finally, the satisfactory EFA and CFA results in table 4.1 present convergent and discriminant validity.

Table 4.1: EFA and CFA results

	Exploratory Factor Analysis					Factor Loadings
	1	2	3	4	5	
Integration 2	.817					.834
Integration 4	.869					.877
Integration 5	.853					.868
Partner Dependence 1		.883				.899
Partner Dependence 2		.838				.887
Partner Dependence 3		.740				.721
Balance 1			.740			.780
Balance 2			.772			.784
Balance 6			.886			.881
Tech. Turbulence 2				.731		.888
Tech. Turbulence 3				.757		.900
Tech. Turbulence 4				.823		.731
Market Turbulence 5					.808	.892
Market Turbulence 6					.863	.892

Table 4.2: Independent Variables

Constructs	Mean	SD	1	2	3	4
1. Adaptation Integration	4.85	.99				
2. Adaptation Balance	2.82	.66	.047/.002			
3. Tech. Turbulence	4.88	1.26	.172/.029	-.036/.001		
4. Market Turbulence	4.11	1.34	.151/.022	.277**/.077	.408**/.166	
5. Partner Dependence	5.38	1.15	.210*/.044	-.169/.028	.275**/.075	-.015/.000

*, ** significant at the 0.05, 0.01 levels, respectively (2-tailed).
X/Y: Xs are correlations and Ys are squared correlations

Table 4.3: Measurement Model

Measurement Model	Construct Reliability	AVE	Scale Reliability
Adaption Integration	.82	.60	.82
Employees are proficient at exchanging ideas to create opportunities			
Employees are capable of sharing their expertise to bring new projects or initiatives to fruition			
Employees have learned to effectively pool their ideas and knowledge			
Adaption Balance	.76	.53	.78
In my business unit, learning to accommodate needed product changes tends to focus on…			
… updating existing knowledge *vs.* developing completely new knowledge			
… knowledge for near term issues *vs.* for long-term issues			
… exploiting existing knowledge of mature technologies *vs*. exploring for new knowledge for new technologies			
Partner Dependence	.80	.58	.78
This customer would be difficult to replace.			
This customer would be costly to lose.			
We are dependent on this customer.			
Technological Turbulence	.81	.60	.77
Technological changes provide big opportunities.			
Several new product ideas have been made possible through technological breakthroughs.			
Technological developments are rather minor.			
Market Turbulence	.73	.57	.73
Customer product preferences change quite a bit over time.			
Our customers tend to look for new products all the time.			

Model fit: Chi-Square = 74.32, df = 67, RMSEA = .032, CFI = .98

Performance Outcome and Control Variables

All performance constructs have shown that they are reliable scales with high Cronbach's alpha coefficients. Their statistics are summarized in tables table 4.4.

Table 4.4: Performance Variable Statistics

	Cronbach's α	1	2	3	4
1. Sale	.882				
2. Market share	.883	.687**			
3. ROI	.891	.689**	.620**		
4. Profit	.885	.625**	.585**	.889**	
5. Marketing Objective	.776	.630**	.601**	.591**	.609**

**. Correlation is significant at the 0.01 level (2-tailed).

Checking Regression Assumptions

According to Hair et al. (2006), data preparation for multiple regression requires special attention to missing data, outliers, and four assumptions of linearity, constant variance of error terms, independence of error terms, and normality of error distribution. After examining missing data before doing confirmatory analysis, I used Mahalanobis distance method for detecting multivariate outliers. Five independent variables (adaptation integration, balance, market turbulence, technological turbulence, and power dependence) with dependent variables were used to calculate t-values for Mahalanobis distance. Overall, at the threshold value of 2.5 for small samples (less than 80 observations), there are four outliers. However, at the threshold value of 4 for larger samples, there are no multivariate outliers. Given the sample with 108 observations, I retained all for further analysis.

Using Durbin-Watson statistic to verify the independence of error terms, I found that all Durbin-Watson statistics are within the lower and the upper limits (Savin and White 1977), which indicates good independence of error terms. For example, table 4.5 has the Durbin-Watson value of 1.603 with all predictors (k = 14). Then the upper limit for sample size of 100 and k = 14 is 2.0 and the lower limit is 1.371. Across models, VIF values around 1 and tolerance values around .7-.9 suggest an acceptable level of multi-collinearity (table 4.6). Finally, normal probability plots and partial residual plots also indicate acceptable linearity and normality of error terms (figure 4.1, 4.2, and 4.3).

Table 4.5: Model Summary with Durbin-Watson Statistic

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.785	.616	.559	.75678	1.603

Table 4.6: Collinearity Statistics

Model	Tolerance	VIF
Size	.82	1.22
Relationship Length	.76	1.32
Reciprocal Adaptation	.94	1.07
Adaptation Integration	.88	1.14
Adaptation Balance	.86	1.16
Tech. Turbulence	.70	1.42
Market Turbulence	.72	1.40
Partner Dependence	.86	1.16

Figure 4.1: Normal Probability Plot

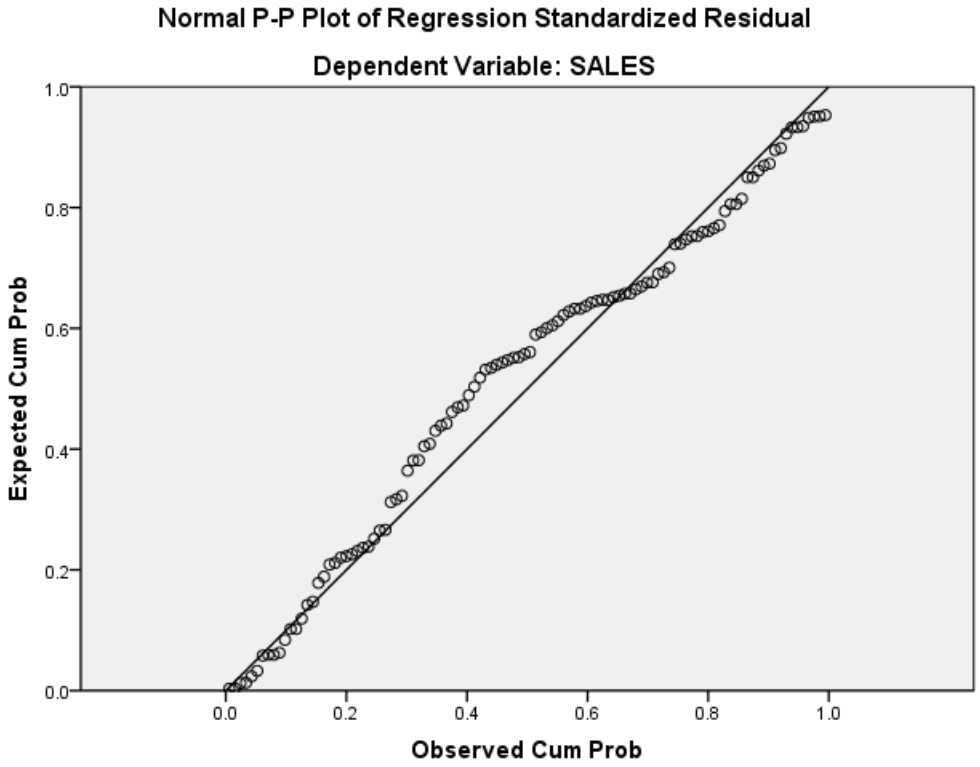


Figure 4.2: Partial Regression Plot: Sales × Adaptation Integration

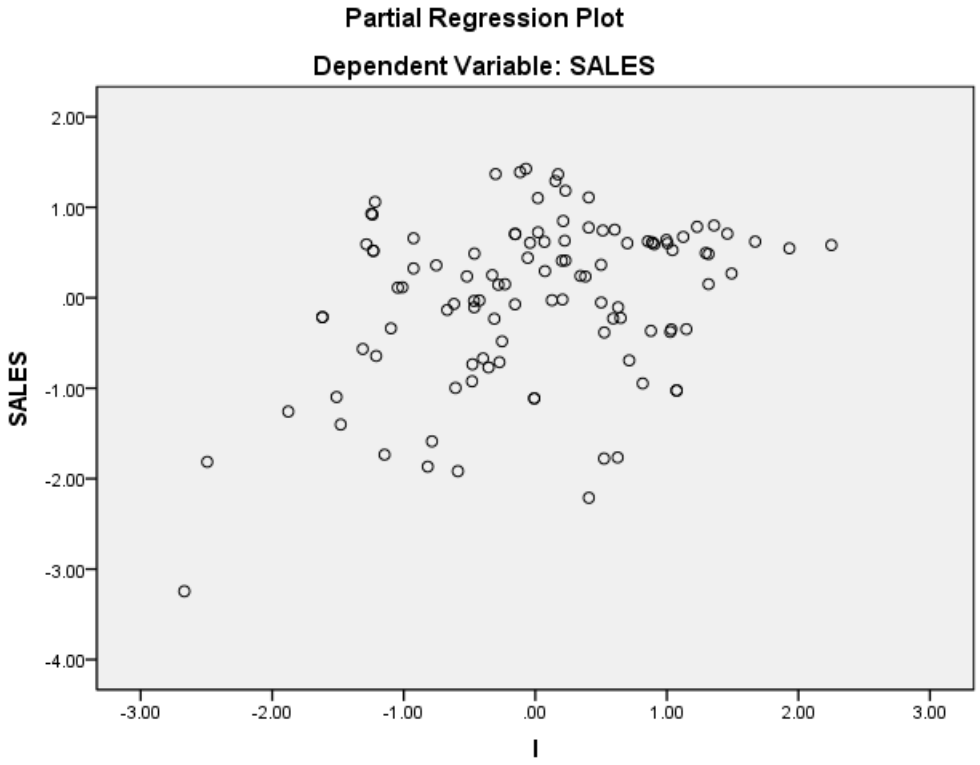
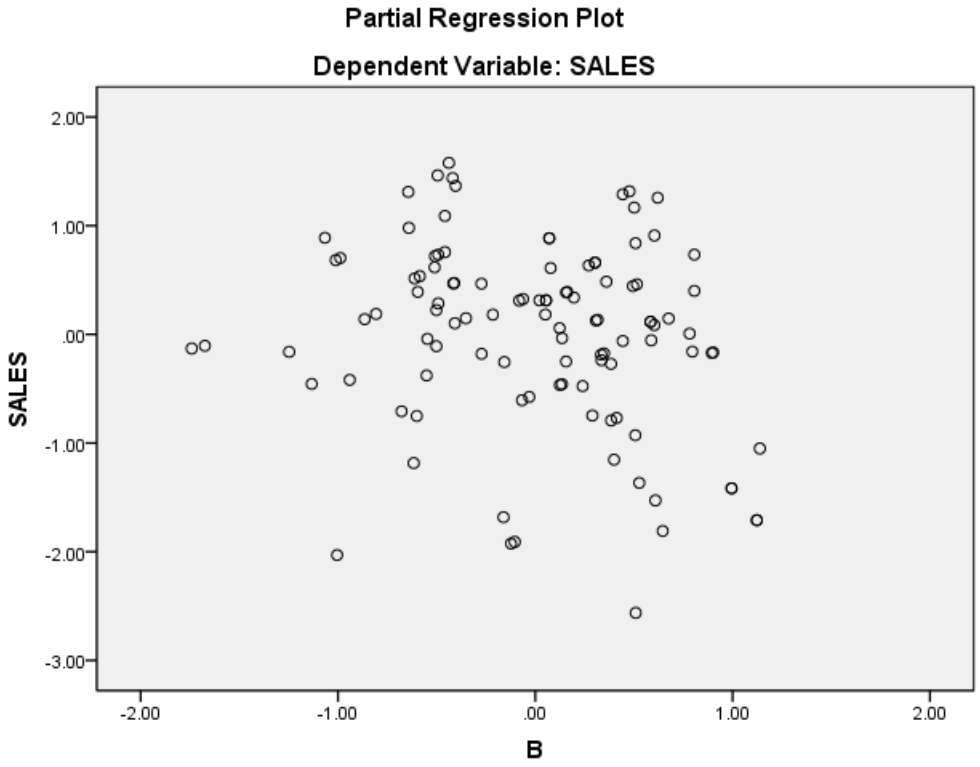


Figure 4.3: Partial Regression Plot: Sales × Adaptation Balance



Hypotheses Testing

Following procedures for hierarchical regression analysis, summated scales representing theoretical constructs were used for testing main and interaction effects (table 4.2). For independent variables, the analysis went through three stages: (1) examining control variables, (2) examining main effect variables, and (3) examining interaction effects. For dependent variables, each of five variables representing new product success was examined separately.

From the stages 1 and 2 of the analysis process, the effects posited in hypotheses 1a and 1b were examined. At the stage 3, moderation effects in hypotheses 2a, 2b, 3a, 3b, 4a, and 4b were analyzed. Assumptions for multiple regressions were also considered.

Hypothesis 1:

H1a: New product success is positively associated with adaptation balance.
H1b: New product success is positively associated with adaptation integration.

Shown in the table 4.7 are the testing results for H1a and b. With the large R square change, the effect of adaptation integration on new product success is significant at the .01 level across all dependent variables.

For H1a, the result shows that the effect is mixed. In particular, adaptation balance has significant effect on sales and on marketing objective. In addition, all effects across other dependent variables are negative. As such, H1a is not supported by the data.

Given this result, I further examine the effect of balance in low/high adaptation integration groups and low/high adaptation balance groups. This consideration is based on the fact that extant research mainly focuses on the group with high adaptation integration and high adaptation balance (Cao, Gedajlovic, and Zhang 2009). However, there is no consistent pattern of effect among these groups. As a result, I speculate that the expected effect of adaptation balance may appear in certain moderating conditions in the subsequent analysis.

Table 4.7: Main Effects of Adaptation Balance and Integration

DV:	Sales			Market Share			ROI			Profit			Objective		
Control variables															
Int	.381**		.396**	.400**		.410**	.423**		.430**	.403**		.411**	.505**		.518**
Bal		-.242*	-.264**		-.138	-.161		-.107	-.131		-.113	-.136		-.204*	-.233**
ΔR^2	.140	.056	.207	.154	.018	.179	.172	.011	.188	.156	.012	.174	.245	.040	.297
$F(\Delta R^2)$	17.52**	6.41*	13.97**	19.17**	1.97	11.38**	21.79**	1.66	12.07**	19.85**	1.32	11.19**	34.43**	4.39*	22.26**

*, ** significant at the 0.05 and 0.01 levels, respectively (2-tailed).
(Int: adaptation integration, Bal: adaptation balance)

Hypotheses 2

H2a: The relationship between new product success and adaptation balance is stronger when market turbulence is high than when it is low.
H2b: The relationship between new product success and adaptation integration is stronger when market turbulence is high than when it is low.

From table 4.8 there are interaction effects of adaptation balance and market turbulence on new product success measures except marketing objective. However, the results also suggest that there are no moderating effects of market turbulence and adaptation integration on new product success. As such, H2a is supported by the data whereas H2b is not supported.

Table 4.8: Moderating Effect of Market Turbulence and Adaptation Balance

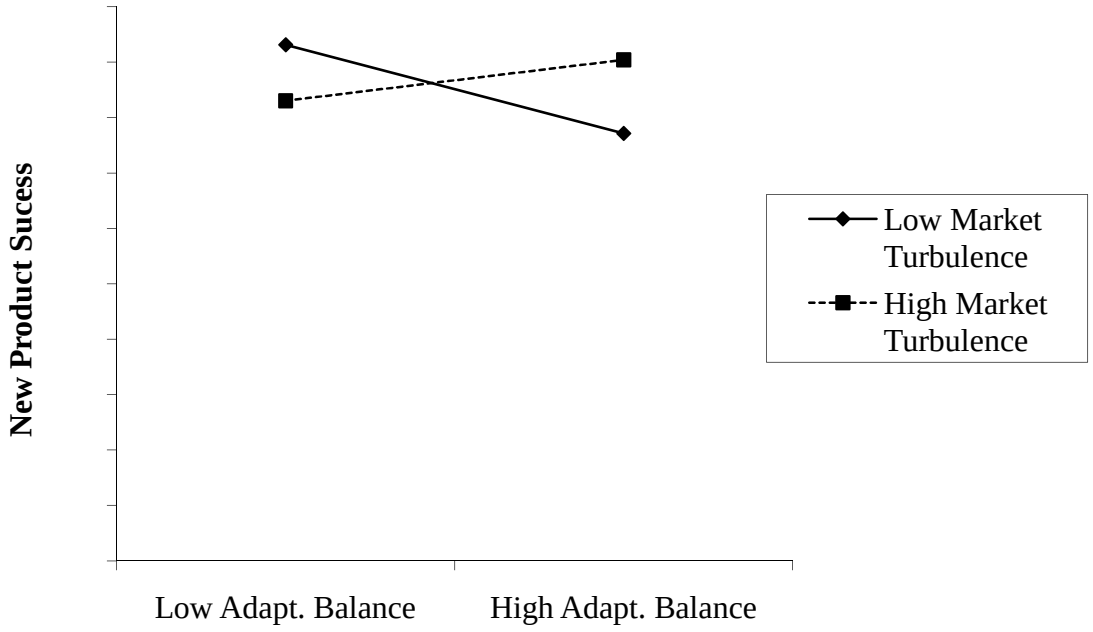
DV:	Sales		Market Share		ROI		Profit		Objective	
Control Variables										
Int	.328**	.370**	.362**	.404**	.376**	.438**	.356**	.409**	.457**	.472**
Bal	-.278**	-.294**	-.148	-.170	-.088	-.0119	-.097	-.139	-.291**	-.296**
Mark	.201*	.175	.075	-.045	-.003	-.041	-.019	-.038	.314**	.306**
Bal×Mark	.196*		.195*		.289**		.281**		.067	
Int×Mark		-.027		-.008		.015		.064		-.018
ΔR^2	.035	.001	.034	.000	.076	.000	.071	.004	.004	.000
$F(\Delta R^2)$	4.98*	.092	4.49	.008	10.05**	.027	9.85**	.463	.675	.050

*, ** significant at the 0.05 and 0.01 levels, respectively (2-tailed).
(Int: adaptation integration, bal: adaptation balance, mark: market turbulence)

For the interaction effect, simple slope analysis suggested by Aiken and West (1991) is used to analyze the nature of interaction. In particular, simple slopes of adaptation balance on new product success is examined under different levels of market turbulence. At low market turbulence or one standard deviation below the mean, the simple slope is – 0.6 (*p-value* = .004). At high market turbulence or one standard

deviation above the mean, the simple slope is 0.28 (*p-value* = .226). This result shows that in high market turbulent environments, adaptation balance has no significant effect on new product success. However, in low market turbulent environments, adaptation balance is detrimental to the business performance.

Figure 4.4: Adaptation Balance × Market Turbulence



Hypotheses 3

H3a: The relationship between new product success and adaptation balance is stronger when technological turbulence is high than when it is low.
H3b: The relationship between new product success and adaptation integration is stronger when technological turbulence is high than when it is low.

From tables 4.9, there are consistent moderating effects of technological turbulence and either adaptation balance or adaptation integration across several representatives of new product success. However, while H3a is supported by the data, H3b is not supported due to the negative moderating effects.

Table 4.9: Moderating Effect of Technological Turbulence and Adaptation Balance

DV:	Sales		Market Share		ROI		Profit		Objective	
Control Variables										
Int	.270**	.307**	.257**	.311*	.298**	.352**	.286**	.344**	.414**	.453**
Bal	-.249**	-.186*	-.147	-.077	-.127	-.058	-.130	-.082	-.216*	-.189*
Tech	.331**	.278**	.382**	.319**	.285**	.223*	.281**	.231**	.293**	.269**
Bal×Tech	.192*		.246**		.245*		.225*		.140	
Int×Tech		-.193*		-.203*		-.197*		-.118		-.059
ΔR^2	.028	.032	.046	.035	.046	.034	.039	.012	.015	.003
$F(\Delta R^2)$	4.14*	5.01*	7.06**	5.03*	6.59*	4.71*	5.49*	1.65	2.51	.495

*, ** significant at the 0.05 and 0.01, respectively (2-tailed).
(Int: adaptation integration, bal: adaptation balance, tech: technological turbulence)

Similar to H2a, H3a effect shown in the figure 4.5 presents that in high technological turbulent environments, adaptation balance has no significant effect on new product success (Coeff. = .131, *p-value* = .529). However, in low technological turbulent environments, adaptation balance is detrimental (Coeff. = -0.681, *p-value* = .004).

Given the negatively significant interaction of adaptation integration and technological turbulence, simple slope analysis in figure 4.6 shows that adaptation integration is more effective in low technological turbulent environments (Coeff. = .553, *p-value* = .000) than in high technological turbulent environments (Coeff. = .217, *p-value* = .111).

Figure 4.5: Adaptation Balance × Technological Turbulence

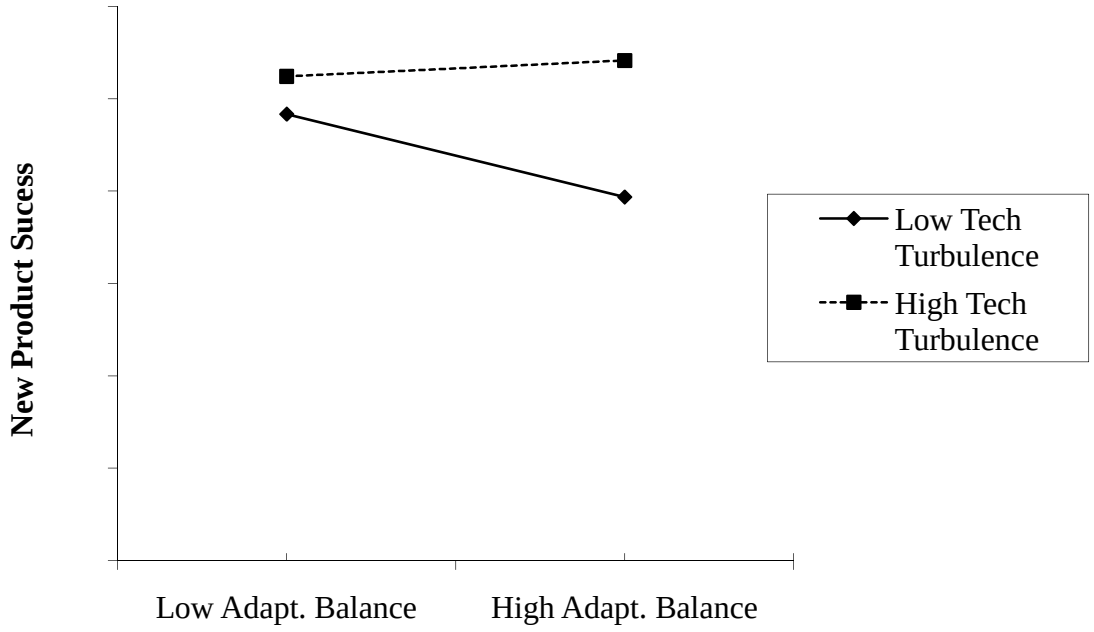
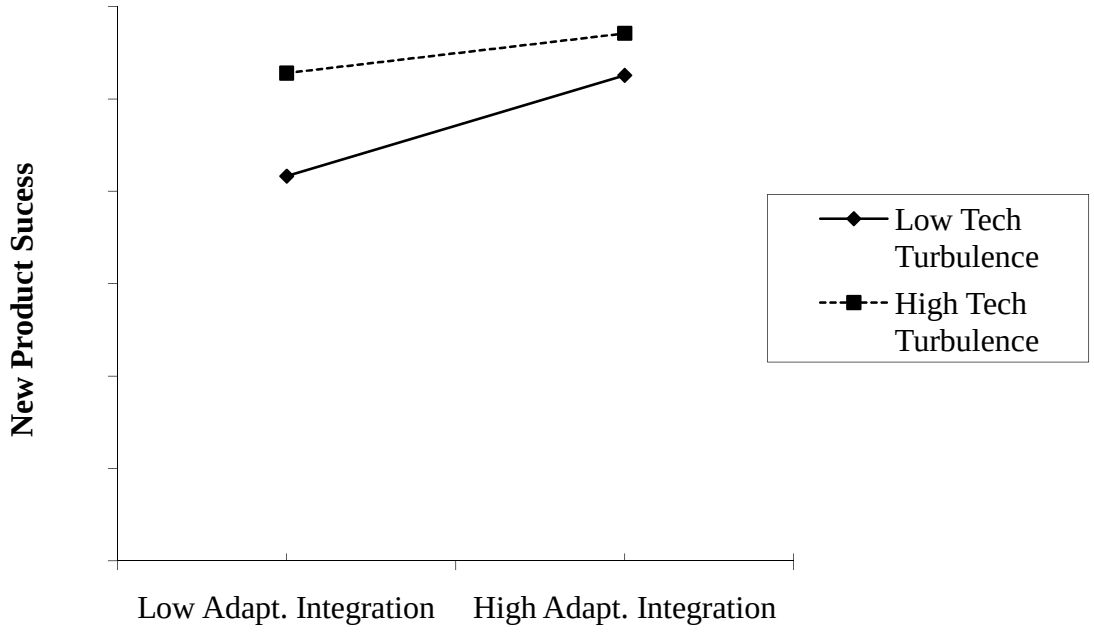


Figure 4.6: Adaptation Integration × Technological Turbulence



Hypotheses 4

H4a: The relationship between new product success and adaptation balance is stronger when a firm's dependence on its partner is high than when it is low.
H4b: The relationship between new product success and adaptation integration is stronger when a firm's dependence on its partner is high than when it is low.

Results from the table 4.10 have shown that H4a is supported for moderating effects on sales, ROI, and profitability. R-square changes resulting from adding the moderating effect are significant at .01 (Sales), at .05 (ROI) and, at .05 (profitability). For H4b, results show a consistent pattern of insignificant R-square changes. H4b is not supported.

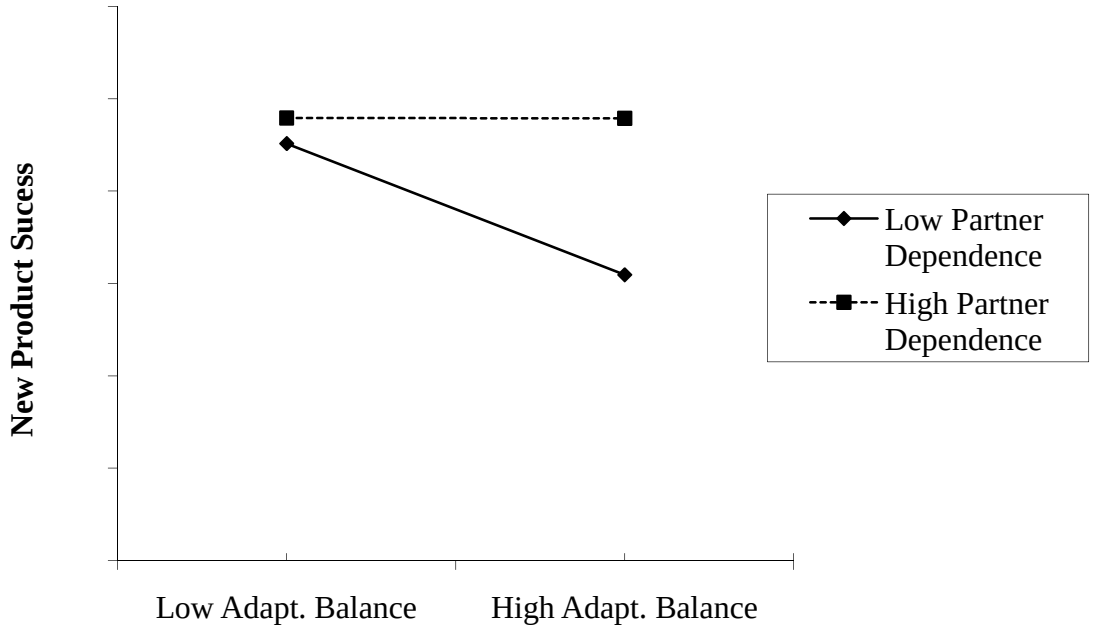
Table 4.10: Moderating Effect of Partner Dependence and Adaptation Balance

DV:	Sales		Market Share		ROI		Profit		Objective	
Control Variables										
Int	.234**	.291**	.287**	.311**	.342**	.371**	.339**	.366**	.460**	.448**
Bal	-.314**	-.168*	-.147	-.072	-.185**	-.071	-.1.89	-.091	-.197*	-.164
Part	.432**	.408**	.424**	.407**	.190*	.158	.150	.127	.252**	.224**
Bal×Part	.323**		.155		.222*		.201		.023	
Int×Part		-.100		-.073		-.137		-.096		-.123
ΔR^2	.071	.008	.016	.004	.033	.016	.028	.008	.000	.012
$F(\Delta R^2)$	13.81**	1.42	2.61	.681	507*	2.07	4.08	.998	.060	2.03

*, ** significant at the 0.05 and 0.01 levels, respectively (2-tailed).
(Int: adaptation integration, bal: adaptation balance, part: partner dependence)

In the figure 4.7, the moderation effect suggests that adaptation balance has no effect in high partner dependent relationships (Coeff. = -.003, *p-value* = .985) whereas adaptation balance worsen the business performance in low partner dependent relationships (Coeff. = -1.077, *p-value* = .000).

Figure 4.7: Adaptation Balance × Partner Dependence



Full Model – Stepwise Regression

Table 4.11: Full Model Summary

DV: Sales	Sales	Market share	ROI	Profit	Objective
Int		.198*	.242**	.248**	.407**
Bal	-.316**			-.190*	-.247**
Mark	.194*				.272**
Tech	.186*	.265**	.231**	.254**	
Part	.358**	.402**			.243**
Int×Mark					
Bal×Mark	.230**		.322**	.286**	
Int×Tech	-.183*		-.224**		
Bal×Tech		.245**			
Int×Part					
Bal×Part	.439**		.249**	.278**	
Adj. R^2	.566	.428	.375	.336	.388
F	18.41**	17.01**	11.68**	10.03**	17.93**

Again, in the table 4.11 the full model stepwise regression confirms effects examined in the above hypotheses testing. In particular, moderation effects of adaptation balance and integration are consistent.

Robustness Checks

To further evaluate significance of the results of main effects and interactions, there were two robustness checks implemented: statistical power analysis and sensitivity analysis. Statistical power analysis addresses the concern whether the failed-to-reject conclusions are reliable. This is the matter of detectability of the effect, or a function of and effect size and the sample size. As such, this post hoc analysis provided information on the robustness of hypotheses testing. Another aspect of robustness is whether the result may be affected by influential or extreme cases. In other words, it is whether the results still hold without potentially influential cases. For the sensitivity analysis, about 10% of extreme value cases (with 108 observations - top 5 cases and bottom 5 cases) based on values of key constructs were taken out for a regression without influential cases. The regression results were compared and shown in the table 4.12 below.

The results also show that 10% of the data significantly affects the proportion of variance explained, about additional 10%. However, the main effects and moderation effects are still the same. This result confirms the robustness of the findings.

Table 4.12: Sensitivity Analysis

DV: Sales	Without influential		Original data	
	β	Sig.	β	Sig.
Control variables				
Int	.082	.344	.082	.287
Bal	-.241	.010	-.313	.000
Mark	.069	.487	.175	.036
Tech	.139	.147	.166	.053
Part	.397	.000	.350	.000
Bal×Mark	.276	.007	.184	.021
Int×Mark	-.083	.443	.115	.257
Bal×Tech	-.072	.452	.013	.881
Int×Tech	.160	.189	-.268	.026
Bal×Part	.529	.000	.401	.000
Int×Part	-.052	.529	.027	.758
Adj. R^2	.462		.559	
F	6.96		10.67	

For power analysis, effect sizes, degree of freedom of the numerator of the F ratio, and the non-centrality parameter are calculated for determining power value from power tables in Cohen (1977). A power check on the dependent variable sales is shown in table 4.13.

As shown in the table 4.13, all unsupported moderating effects (models V, VI, and VIII) have high statistical power given the effect sizes and sample size. This means sample is larger enough for examining moderating effects. This result confirms the robustness of the moderating effects.

On the main effect of balance, model II, the power is only 76%. By convention, 80% is the acceptable level of statistical power. Fortunately, when I further examine the

power of for model II with the data without influential observations as shown in the table 4.14, the power is over 80%. Given the similarity between models with and without influential observations as examined the table 4.12, this is also confirm the robustness of the findings.

Table 4.13: Power Analysis

DV: Sales	I	II	III	IV	V	VI	VII	VIII	IX
Int	.381**		.396**	.332**	.390**	.256**	.225**	.291**	.082
Bal		-.242*	-.264**	-.263**	-.274**	-.206*	-.296**	-.168	-.313**
Mark				.221*	.131				.175
Tech						.307**			.166
Part							.414**	.408**	.350**
Bal×Mark				.219*	-.023				.184
Int×Mark				-.086					.115
Bal×Tech						.163			.013
Int×Tech						-.168			-.268**
Bal×Part							.317**		.401**
Int×Part							-.081	-.100	.027
ΔR^2	.140	.056	.207	.041	.001	.052	.076	.008	.163
$F(\Delta R^2)$	17.52**	6.145*	13.98**	2.93	.092	4.123*	7.43**	1.42	6.59**
$f^2 = SS_{reg}/SS_{res}$	.218	.106	.327	.45	.370	.599	.973	.740	1.60
df_{res}	103	103	102	99	100	99	99	100	93
$L = f^2\, df_{reg}$	22.4	10.92	33.31	44.55	37.0	59.3	96.29	73.95	149.39
df_{reg}	4	4	5	8	7	8	8	7	14
A	.05	.05	.05	.05	.05	.05	.05	.05	.05
Power	96%	76.2%	99.5%	99.5%	99.5%	99.5%	99.5%	99.5%	99.5%

*, ** significant at the 0.05 and 0.01 levels, respectively (2-tailed).
(Int: adaptation integration, bal: adaptation balance, mark: market turbulence, tech: technological turbulence, part: partner dependence)

Table 4.14: Power Analysis Between With- and Without Influential

DV: Sales	Data with influential	Data without influential
Control Variables		
Bal	-.242*	-.138
ΔR^2	.056	.018
$F(\Delta R^2)$	6.145*	1.94
$f^2 = SS_{reg}/SS_{res}$	.106	1.35
df_{res}	103	92
$L = f^2\, df_{reg}$	10.92	12.55
df_{reg}	4	4
α	.05	.05
Power	76.2%	81.93%

CHAPTER V

CONCLUSION

DISCUSSION

Given the key question of research is whether adaptation ambidexterity improves new product performance, the results have shown that adaptation ambidexterity is an important factor explained by the theory of ambidexterity, supported by the data, and needed further considerations. First, adaptation integration, one of the two components of being ambidextrous, has strong and consistent effects on new product performance. Second, even though adaptation balance, the other component of being ambidextrous, has a main counter-effect, it does play important roles under certain conditions of relationship marketing, i.e. high technological turbulence, market turbulence, and partner dependence. Third, the negative main effect of adaptation balance and the post hoc analyses of interaction effects (figure 4.4, 4.5, and 4.7) suggest that relationship marketing is a complex learning environment in which a further close-up examination is needed for a deeper understanding of the phenomenon. Finally, the negative interaction effect of

adaptation integration and technological turbulent environment in this study in fact suggest that adaptation integration is more effective in low technological turbulence that in high technological turbulence.

In particular, adaptation integration presents the fact that the synergy process of ambidexterity is an important source for knowledge and learning, which supports the theory of ambidexterity in the context of relationship marketing. From table 4.10 and figures 4.4, 4.5, and 4.7 the significant and positive effect of adaptation integration and the significant interaction effects of adaptation balance further confirm the full-blown capacity of the ambidexterity in relationship marketing. Second, the seemingly negative effect of adaptation balance raises some interesting concern about the true effect of balance component. From the simple slope analyses in the figure 4.6, the results are straightforward. Under low market turbulence, low technological turbulence, and low partner dependence adaptation balance may in fact negatively affect performance. Under the high levels of these factors, adaptation balance is non-detrimental condition for ambidexterity. This finding confirms the fact that being balanced without justification may harm business performance (Atuahene-Gima and Murray 2007). Given the complexity of inter-firm relationship, the situation suggests that further examination of other factors moderating the effect of adaptation balance may be needed. A good starting point is whether relationship marketing context may in fact obstruct the effectiveness of adaptation balance. For example, that counter-argument would help specify the extent to which long-term orientation promotes ambidexterity in terms of adaptation balance and the extent to which a tightly coupled relationship may deter ambidexterity. By nature, in product adaptation, a tightly coupled system often strictly determines what, when, and

how; whereas a loosely coupled one allows more degree of freedom, which may not impede ambidexterity. Finally, although adaptation integration has a strong effect on new product success, its negative interaction with technological turbulence suggests that further examination on the interaction between adaptation balance and adaptation integration in low technological environments may be needed, given the detrimental effect of adaptation balance on new product performance.

In general, technological turbulence, market turbulence, and partner dependence are among typical yet general factors representing marketing, technology, and relationship norms aspects of business relationship. A more fine-grained consideration of business relationship factors would shed light on whether adaptation integration improves business performance in certain conditions of interest.

IMPLICATIONS

Even the findings on the role of adaptation ambidexterity are still in the early stage of knowledge development, there are important implications for practice as well as future research. That is, by confirming the theory of ambidexterity, this study offers an important venue for improving product-based adaptation, relationship learning, key account management, and new product development. Adaptation ambidexterity improves performance in product based adaptation by the integration process and in critical situations like high market turbulence, technological turbulence, and high partner dependence. Adaptation ambidexterity improves relationship learning by improving the effectiveness of relationship-specific investment, which is an important mechanism of relationship learning (Kang, Mahoney, and Tan 2009). Having significant effect in new product success, ambidexterity also provides a new approach to improve key account

management practice, which is important in business to business marketing (Workman, Homburg, and Jensen 2003). Similarly, new product development also benefits from the idea of being ambidextrous.

As this study is one of the first to explore the phenomenon of adaptation ambidexterity, future research is needed. In the short-term, a focus on some important characterizing features of marketing, technology, and business relationship would provide better understanding of the role of adaptation ambidexterity. For the long-term, there are at least two issues need to be developed. First, antecedents and consequences of adaptation ambidexterity need to be addressed to provide a more complete understanding. Second, as a learning process occurs within the boundary of an organization for the purpose of serving external business partners, another concern is how such adaptation ambidexterity occurs in an inter-organizational setting, or whether certain characteristics at the level of inter-organization may affect the process of adaptation.

LIMITATIONS

Given the research question, the three key limitations of this dissertation are the cross-sectional design, the small sample size, and the sampled industries. A cross-sectional design is limited in reflecting the effect of a specific, ongoing adaptation project on new product development. A cross-sectional design therefore provides a general snapshot of the ambidextrous effect with a general evaluation of new product development performance.

Small sample size limits the power to detect significant effect of ambidexterity as well as the capacity to implement reliable post hoc analyses for knowledge exploration.

This limitation therefore requires future research to explore many issues discussed in the previous section.

Finally, while a focus on manufacturing, high-tech industries may help reveal the effect of adaptation ambidexterity, an inclusion of different types of industry, i.e manufacturing versus service-based, high-tech versus non high-tech, would reinforce the generalizability of the findings.

REFERENCES

Aguinis, H (1995), "Statistical Power with Moderated Multiple Regression in Management Research," *Journal of Management*, 21 (6), 1141.

Aiken, Leona S., Stephen G. West, David E. Schwalm, James L. Carroll, and Shenghwa Hsiung (1998), "A Comparison of a Randomized and Two Quasi-Experimental Designs in a Single Outcome Evaluation: Efficacy of a University-Level Remedial Writing Program," *Evaluation Review*, 22 (2), 207-44.

Aiken, Leona and Stephen West (1991), *Multiple Regression: Testing and Interpreting Interactions*: Sage Publications, Inc.

Anderson, James C. and David W. Gerbing (1988), "Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach," *Psychological Bulletin*, 103 (3), 411.

Anderson, James C. and James A. Narus (1990), "A Model of Distributor Firm and Manufacturer Firm Working Partnerships," *Journal of Marketing*, 54 (1), 42.

Argyris, Chris (1983), "Action Science and Intervention," *Journal of Applied Behavioral Science*, 19 (2), 115-40.

---- (1976), "Single-Loop and Double-Loop Models in Research on Decision Making," *Administrative Science Quarterly*, 21 (3), 363-75.

Armstrong, J. Scott and Terry S. Overton (1977), "Estimating Nonresponse Bias in Mail Surveys," *Journal of Marketing Research*, 14 (3), 396.

Arnold, Hugh J. (1982), "Moderator Variables: A Clarification of Conceptual, Analytic, and Psychometric Issues," *Organizational Behavior and Human Performance*, 29 (2), 143-74.

Arnold, Hugh J. and Martin G. Evans (1979), "Testing Multiplicative Models Does Not Require Ratio Scales," *Organizational Behavior and Human Performance*, 24 (1), 41-59.

Atuahene-Gima, Kwaku (2005), "Resolving the Capability-Rigidity Paradox in New Product Innovation," *Journal of Marketing*, 69 (4), 61-83.

Atuahene-Gima, Kwaku and Janet Y. Murray (2007), "Exploratory and Exploitative Learning in New Product Development: A Social Capital Perspective on New Technology Ventures in China," *Journal of International Marketing*, 15 (2), 1.

Baron, RM and DA Kenny (1986), "The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic and Statistical Considerations.(1986)," *Journal of Personality and Social Psychology*, 51, 1173-82.

Beckman, Christine M. (2006), "The Influence of Founding Team Company Affiliations on Firm Behavior," *Academy of Management Journal*, 49 (4), 741-58.

Brennan, D. Ross, Peter W. Turnbull, and David T. Wilson (2003), "Dyadic Adaptation in Business-to-Business Markets," *European Journal of Marketing*, 37 (11/12), 1636-65.

Brennan, Ross and Peter W. Turnbull (1998a), "Adaptations in Buyer-Seller Relationships," in *Network Dynamics in International Marketing*, Peter Naude and Peter W. Turnbull, eds. Oxford: Elsevier.

---- (1998b), "Adaptations in Buyer-Seller Relationships," in *Network Dynamics in International Marketing*, Peter Naude and Peter W. Turnbull, eds. Oxford: Elsevier.

Brusoni, Stefano and Andrea Prencipe (2001), "Managing Knowledge in Loosely Coupled Networks: Exploring the Links between Product and Knowledge Dynamics," *The Journal of Management Studies*, 38 (7), 1019-35.

Bryan, Angela D., Leona S. Aiken, and Stephen G. West (1999), "The Impact of Males Proposing Condom Use on Perceptions of an Inital Sexual Encounter," *Personality and Social Psychology Bulletin*, 25 (3), 275-86.

Buvik, Arnt and Kjell Grønhaug (2000), "Inter-Firm Dependence, Environmental Uncertainty and Vertical Co-Ordination in Industrial Buyer-Seller Relationships," *Omega*, 28 (4), 445-54.

Calantone, Roger, Rosanna Garcia, and Cornelia Droge (2003), "The Effects of Environmental Turbulence on New Product Development Strategy Planning," *The*

Journal of Product Innovation Management, 20 (2), 90-103.

Cannon, Joseph P. and William D. Perreault, Jr. (1999), "Buyer-Seller Relationships in Business Markets," *Journal of Marketing Research*, 36 (4), 439-60.

Cao, Qing, Eric Gedajlovic, and Hongping Zhang (2009), "Unpacking Organizational Ambidexterity: Dimensions, Contingencies, and Synergistic Effects," *Organization Science*, 20 (4), 781-96,829,31.

Carmeli, Abraham and Benny Azeroual (2009), "How Relational Capital and Knowledge Combination Capability Enhance the Performance of Work Units in a High Technology Industry," *Strategic Entrepreneurship Journal*, 3 (1), 85-103.

Cohen, Jacob (1977), *Statistical Power Analysis for the Behavioral Sciences*. New York: Academic Press.

Connor, Tom (1999), "Research Notes and Communications: Customer-Led and Market-Oriented: A Matter of Balance," *Strategic Management Journal*, 20 (12), 1157.

Dillman, Don A. (1991), "The Design and Administration of Mail Surveys," *Annual Review of Sociology*, 17, 225.

Dodgson, Mark (1993), "Organizational Learning: A Review of Some Literatures," *Organization Studies*, 14 (3), 375.

Duncan, Robert B. (1976), "The Ambidextrous Organization: Designing Dual Structures for Innovation," in *The Management of Organization Design: Strategies and Implementation*, Ralph H. Kilmann, Louis R. Pondy, and Dennis P Slevin, eds. Vol. 1. New York: North-Holland

Dyer, Jeffrey H. and Harbir Singh (1998), "The Relational View: Cooperative Strategy and Sources of Interorganizational Competitive Advantage," *The Academy of Management Review*, 23 (4), 660-79.

Eisenberg, Nancy, Yue Ma, Lei Chang, Qing Zhou, Stephen G. West, and Leona Aiken (2007), "Relations of Effortful Control, Reactive Undercontrol, and Anger to Chinese Children's Adjustment," *Development and Psychopathology*, 19 (2), 385-409.

Fang, Eric (2008), "Customer Participation and the Trade-Off between New Product Innovativeness and Speed to Market," *Journal of Marketing*, 72 (4), 90.

Fornell, Claes and David F. Larcker (1981), "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research*, 18 (1), 39.

Gibson, Cristina B. and Julian Birkinshaw (2004), "The Antecedents, Consequences, and Mediating Role of Organizational Ambidexterity," *Academy of Management Journal*, 47 (2), 209-26.

Gulati, Ranjay, Paul R. Lawrence, and Phanish Puranam (2005), "Adaptation in Vertical Relationships: Beyond Incentive Conflict," *Strategic Management Journal*, 26 (5), 415-40.

Gulati, Ranjay and Phanish Puranam (2009), "Renewal through Reorganization: The Value of Inconsistencies between Formal and Informal Organization," *Organization Science*, 20 (2), 422-40.

Gupta, Anil K., Ken G. Smith, and Christina E. Shalley (2006), "The Interplay between Exploration and Exploitation," *Academy of Management Journal*, 49 (4), 693-706.

Hair, F. Joseph Jr., C. William Black, J. Barry Babin, E. Rolph Anderson, and L. Ronald Tatham (2006), *Multivariate Data Analysis* (6th ed.). New Jersey: Prentice Hall.

Hakansson, H. (1982), *International Marketing and Purchasing of Industrial Goods*. New York: John Wiley.

Hallen, Lars, Jan Johanson, and Nazeem Seyed-Mohamed (1991), "Interfirm Adaptation in Business Relationships," *Journal of Marketing*, 55 (2), 29.

Han, Jin K., Namwoon Kim, and Rajendra K. Srivastava (1998), "Market Orientation and Organizational Performance: Is Innovation a Missing Link?," *Journal of Marketing*, 62 (4), 30-45.

Hanvanich, Sangphet, K. Sivakumar, and G. Tomas M. Hult (2006), "The Relationship of Learning and Memory with Organizational Performance: The Moderating Role of Turbulence," *Academy of Marketing Science. Journal*, 34 (4), 600-12.

He, Zi-Lin and Poh-Kam Wong (2004), "Exploration Vs. Exploitation: An Empirical Test of the Ambidexterity Hypothesis," *Organization Science*, 15 (4), 481-94.

Hoegl, Martin and Stephan M. Wagner (2005), "Buyer-Supplier Collaboration in Product Development Projects," *Journal of Management*, 31 (4), 530-48.

Holmqvist, Mikael (2004), "Experiential Learning Processes of Exploitation and Exploration within and between Organizations: An Empirical Study of Product Development," *Organization Science*, 15 (1), 70-81.

Homburg, Christian, John P. Workman, Jr., and Ove Jensen (2002), "A Configurational Perspective on Key Account Management," *Journal of Marketing*, 66 (2), 38-60.

Im, Ghiyoung and Arun Rai (2008), "Knowledge Sharing Ambidexterity in Long-Term Interorganizational Relationships," *Management Science*, 54 (7), 1281-96.

Im, Subin and John P. Workman, Jr. (2004), "Market Orientation, Creativity, and New Product Performance in High-Technology Firms," *Journal of Marketing*, 68 (2), 114-32.

Irwin, Julie R. and Gary H. McClelland (2001), "Misleading Heuristics and Moderated Multiple Regression Models," *Journal of Marketing Research*, 38 (1), 100-09.

Jansen, Justin J. P., Frans A. J. Van Den Bosch, and Henk W. Volberda (2006), "Exploratory Innovation, Exploitative Innovation, and Performance: Effects of Organizational Antecedents and Environmental Moderators," *Management Science*, 52 (11), 1661-74.

Jansen, Justin J. P., Gerard George, Frans A. J. Van den Bosch, and Henk W. Volberda (2008), "Senior Team Attributes and Organizational Ambidexterity: The Moderating Role of Transformational Leadership," *The Journal of Management Studies*, 45 (5), 982.

Jaworski, Bernard J. and Ajay K. Kohli (1993), "Market Orientation: Antecedents and Consequences," *Journal of Marketing*, 57 (3), 53.

Johnson, Jean L., Ravipreet S. Sohi, and Rajdeep Grewal (2004), "The Role of Relational Knowledge Stores in Interfirm Partnering," *Journal of Marketing*, 68 (3), 21-36.

Joshi, Ashwin W. (2009), "Continuous Supplier Performance Improvement: Effects of Collaborative Communication and Control," *Journal of Marketing*, 73 (1), 133.

Kang, Min-Ping, Joseph T. Mahoney, and Danchi Tan (2009), "Why Firms Make Unilateral Investments Specific to Other Firms: The Case of Oem Suppliers," *Strategic Management Journal*, 30 (2), 117.

Kim, Stephen Keysuk and Ping-Hung Hsieh (2003), "Interdependence and Its Consequences in Distributor-Supplier Relationships: A Distributor Perspective through Response Surface Approach," *JMR, Journal of Marketing Research*, 40 (1), 101-12.

Kleinschmidt, Elko J. and Robert G. Cooper (1991), "The Impact of Product Innovativeness on Performance," *The Journal of Product Innovation Management*, 8 (4), 240.

Kumar, Nirmalya, Lisa K. Scheer, and Jan-Benedict E. M. Steenkamp (1995), "The Effects of Perceived Interdependence on Dealer Attitudes," *Journal of Marketing Research*, 32 (3), 348.

Kyriakopoulos, Kyriakos and Christine Moorman (2004), "Tradeoffs in Marketing Exploitation Strategies: The Overlooked Role of Market Orientation," *International Journal of Research in Marketing*, 21 (3), 219-40.

Lane, Peter J. and Michael Lubatkin (1998), "Relative Absorptive Capacity and Interorganizational Learning," *Strategic Management Journal (1986-1998)*, 19 (5), 461.

Levinthal, Daniel A. and James G. March (1993), "The Myopia of Learning," *Strategic Management Journal (1986-1998)*, 14 (SPECIAL ISSUE), 95.

Lubatkin, Michael H., Zeki Simsek, Ling Yan, and John F. Veiga (2006), "Ambidexterity and Performance in Small- to Medium-Sized Firms: The Pivotal Role of Top Management Team Behavioral Integration," *Journal of Management*, 32 (5), 646-72.

Lusch, Robert F. and James R. Brown (1996), "Interdependency, Contracting, and Relational Behavior in Marketing Channels," *Journal of Marketing*, 60 (4), 19-38.

March, James G. (1991), "Exploration and Exploitation in Organizational Learning," *Organization Science*, 2 (1), 71-87.

---- (2006), "Rationality, Foolishness, and Adaptive Intelligence," *Strategic Management Journal*, 27 (3), 201-14.

Menguc, Bulent and Seigyoung Auh (2008), "The Asymmetric Moderating Role of Market Orientation on the Ambidexterity-Firm Performance Relationship for Prospectors and Defenders," *Industrial Marketing Management*, 37 (4), 455.

Noordewier, Thomas G., George John, and John R. Nevin (1990), "Performance Outcomes of Purchasing Arrangements in Industrial Buyer-Vendor Relationships," *Journal of Marketing*, 54 (4), 80.

O'Reilly III, Charles A. and Michael L. Tushman (2008), "Ambidexterity as a Dynamic Capability: Resolving the Innovator's Dilemma," *Research in Organizational Behavior*, 28, 185-206.

Page, Albert L. (1993), "Assessing New Product Development Practices and Performance: Establishing Crucial Norms," *The Journal of Product Innovation Management*, 10 (4), 273.

Raisch, Sebastian and Julian Birkinshaw (2008), "Organizational Ambidexterity: Antecedents, Outcomes, and Moderators," *Journal of Management*, 34 (3), 375.

Raisch, Sebastian, Julian Birkinshaw, Gilbert Probst, and Michael L. Tushman (2009), "Organizational Ambidexterity: Balancing Exploitation and Exploration for

Sustained Performance," *Organization Science*, 20 (4), 685-95.

Ritter, Thomas and Achim Walter (2003), "Relationship-Specific Antecedents of Customer Involvement in New Product Development," *International Journal of Technology Management*, 26 (5,6), 482.

Savin, N. E. and Kenneth J. White (1977), "The Durbin-Watson Test for Serial Correlation with Extreme Sample Sizes or Many Regressors," *Econometrica (pre-1986)*, 45 (8), 1989.

Selnes, Fred and James Sallis (2003), "Promoting Relationship Learning," *Journal of Marketing*, 67 (3), 80.

Simsek, Zeki (2009), "Organizational Ambidexterity: Towards a Multilevel Understanding," *The Journal of Management Studies*, 46 (4), 597.

Slater, Stanley F. and John C. Narver (1998), "Customer-Led and Market-Oriented: Let's Not Confuse the Two," *Strategic Management Journal*, 19 (10), 1001-06.

---- (1995), "Market Orientation and the Learning Organization," *Journal of Marketing*, 59 (3), 63.

Smith, Ken G., Christopher J. Collins, and Kevin D. Clark (2005), "Existing Knowledge, Knowledge Creation Capability, and the Rate of New Product Introduction in High-Technology Firms," *Academy of Management Journal*, 48 (2), 346-57.

Smith, Wendy K. (2009), "A Dynamic Approach to Managing Contradictions," *Industrial and Organizational Psychology*, 2, 338-43.

Smith, Wendy K. and Michael L. Tushman (2005), "Managing Strategic Contradictions: A Top Management Model for Managing Innovation Streams," *Organization Science*, 16 (5), 522-36.

Song, X. Michael and Mark E. Parry (1997a), "A Cross-National Comparative Study of New Product Development Processes: Japan and the United States," *Journal of Marketing*, 61 (2), 1-18.

---- (1997b), "The Determinants of Japanese New Product Successes," *Journal of Marketing Research*, 34 (1), 64-76.

Stump, Rodney L., Gerard A. Athaide, and Ashwin W. Joshi (2002), "Managing Seller-Buyer New Product Development Relationships for Customized Products: A Contingency Model Based on Transaction Cost Analysis and Empirical Test," *Journal of Product Innovation Management*, 19 (6), 439-54.

Subramani, Mani R. and N. Venkatraman (2003), "Safeguarding Investments in

Asymmetric Interorganizational Relationships: Theory and Evidence," *Academy of Management Journal*, 46 (1), 46-62.

Takeishi, Akira (2001), "Bridging Inter- and Intra-Firm Boundaries: Management of Supplier Involvement in Automobile Product Development," *Strategic Management Journal*, 22 (5), 403-33.

Taylor, Alva (2010), "The Next Generation: Technology Adoption and Integration through Internal Competition in New Product Development," *Organization Science*, 21 (1), 23-41,308.

Teece, David J., Gary Pisano, and A. M. Y. Shuen (1997), "Dynamic Capabilities and Strategic Management," *Strategic Management Journal (1986-1998)*, 18 (7), 509.

Turnbull, Peter W. and Jean-Paul Valla (1986), *Strategies for International Industrial Marketing: The Management of Customer Relationships in European Industrial Markets*. London: Croom Helm.

Urban, Glen L. and Eric von Hippel (1988), "Lead User Analyses for the Development of New Industrial Pr," *Management Science*, 34 (5), 569.

Wagner, Stephan M. and Martin Hoegl (2006), "Involving Suppliers in Product Development: Insights from R&D Directors and Project Managers," *Industrial Marketing Management*, 35 (8), 936.

Walter, Achim (2003), "Relationship-Specific Factors Influencing Supplier Involvement in Customer New Product Development," *Journal of Business Research*, 56 (9), 721-33.

Wang, Qiong, Kevin Bradford, Jun Xu, and Barton Weitz (2008), "Creativity in Buyer-Seller Relationships: The Role of Governance," *International Journal of Research in Marketing*, 25 (2), 109-18.

Williamson, Oliver E. (1985), *The Economic Institutions of Capitalism : Firms, Markets, Relational Contracting*. New York: Free Press.

Workman, John P., Jr., Christian Homburg, and Ove Jensen (2003), "Intraorganizational Determinants of Key Account Management Effectiveness," *Journal of the Academy of Marketing Science*, 31 (1), 3.

APPENDICES

Oklahoma State University Institutional Review Board

Oklahoma State University Institutional Review Board

Date:	Monday, March 14, 2011
IRB Application No	BU116
Proposal Title:	Interfirm Adaptation Learning: An Ambidextrous Perspective
Reviewed and Processed as:	Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 3/13/2012

Principal Investigator(s):

Binh H. Nguyen
88 S. Univ. Place Apt. 3
Stillwater, OK 74075

Gary Frankwick
312 College of Business
Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☒ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,

Shelia Kennison

Shelia Kennison, Chair
Institutional Review Board

March 14, 2011

Dear Product Manager,

I am a doctoral student at Oklahoma State University examining important issues in interfirm relationships and new product development for my dissertation and need your help with data collection. The enclosed questionnaire takes about 10 minutes to complete. Your responses will be kept completely confidential. Results will be reported only in aggregate form so that no names are included. You can quit at any time. If you don't want to answer a question, just skip it. However, completed questionnaires are important for accuracy of the study, and are appreciated.

In appreciation for your participation, I have provided an option below for you to indicate whether you would like to receive an executive summary of the research result. Please return the questionnaire by the means of your choice, either using the enclosed self-addressed envelope, fax to 405-744-5180, or email to binh.nguyen@okstate.edu. If you have any questions, please contact me or Dr. Frankwick.

Thank you for your help,

Binh H. Nguyen
Doctoral Candidate
Marketing Department
Spears School of Business
Oklahoma State University
Stillwater, OK 74078-4011
405-334-9520
binh.nguyen@okstate.edu

Gary L. Frankwick
Dissertation Advisor
Associate Professor
Spears School of Business
Oklahoma State University
Stillwater, OK 74078-4011
405-744-5192
gary.frankwick@okstate.edu

If you have questions about your rights as a research volunteer, you may contact the Oklahoma State University Institutional Review Board (IRB) Chair, Dr. Shelia Kennison, 219 Cordell North, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu.

If you like, please provide your address and phone number below or attach a business card so that we can send the results of this study.

Name: .....
Company: .....
Address: .....
.....
Phone: ..... Fax: .....
Email: .....

VITA

Binh Hoa Nguyen

Candidate for the Degree of

Doctor of Philosophy

Thesis: ADAPTATION LEARNING: AN AMBIDEXTROUS PERSPECTIVE

Major Field: Marketing

Biographical:

Education:

Completed the requirements for the Bachelor of Industrial Management at Vietnam National University, Hochiminh City University of Technology, Hochiminh City, Vietnam in 1998.

Completed the requirements for the Master of Business Administration in International Business at Asian Institute of Technology, Pathumthani, Thailand in 2001.

Completed the requirements for the Doctor of Philosophy in Marketing at Oklahoma State University, Stillwater, Oklahoma in July, 2011.

Experience:

Lecturer of Marketing, Hochiminh City University of Technology, 2001-2006

Teaching Associate, Oklahoma State University, 2008-2011

Professional Membership:

American Marketing Association from 2010

Name: Binh Hoa Nguyen Date of Degree: December, 2011

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: ADAPTATION LEARNING: AN AMBIDEXTROUS PERSPECTIVE

Pages in Study: 67 Candidate for the Degree of Doctor of Philosophy

Major Field: Marketing

Scope and Method of Study: The dissertation examines whether adaptation, through ambidexterity, helps firms improve their performance. Adaptation ambidexterity is an intrafirm process of balancing and integrating exploration and exploitation learning in a firm's partner-specific investment strategy to develop products according to that partner's changing requirements. Specific research questions are whether: (1) adaptation ambidexterity improves new product performance, and (2) whether the marketing environment characteristics of adaptation (market turbulence, technological turbulence, and partner dependence) affect that relationship. To address these concerns, the dissertation develops scales for adaptation ambidexterity, adaptation balance and adaptation integration. Then, moderated regression is used for main effects and moderation effects. The study employs a cross-sectional design and examines the hypothetical relationships. Key participants to be surveyed were determined using a random list of US high-tech manufacturing firms.

Findings and Conclusions: The results show that adaptation ambidexterity is an important factor that influences new product performance. First, adaptation integration, one of the two components of being ambidextrous, has strong and consistent effects on new product performance. Second, under low market turbulence, low technological turbulence, and low partner dependence adaptation balance may in fact negatively affect performance. Under the high levels of these factors, adaptation balance is non-detrimental condition for ambidexterity. This finding confirms the fact that being balanced without justification may harm business performance. Finally, the negative interaction effect of adaptation integration and technological turbulent environment in this study in fact suggest that adaptation integration is more effective in low technological turbulence that in high technological turbulence.

ADVISER'S APPROVAL: Gary L. Frankwick